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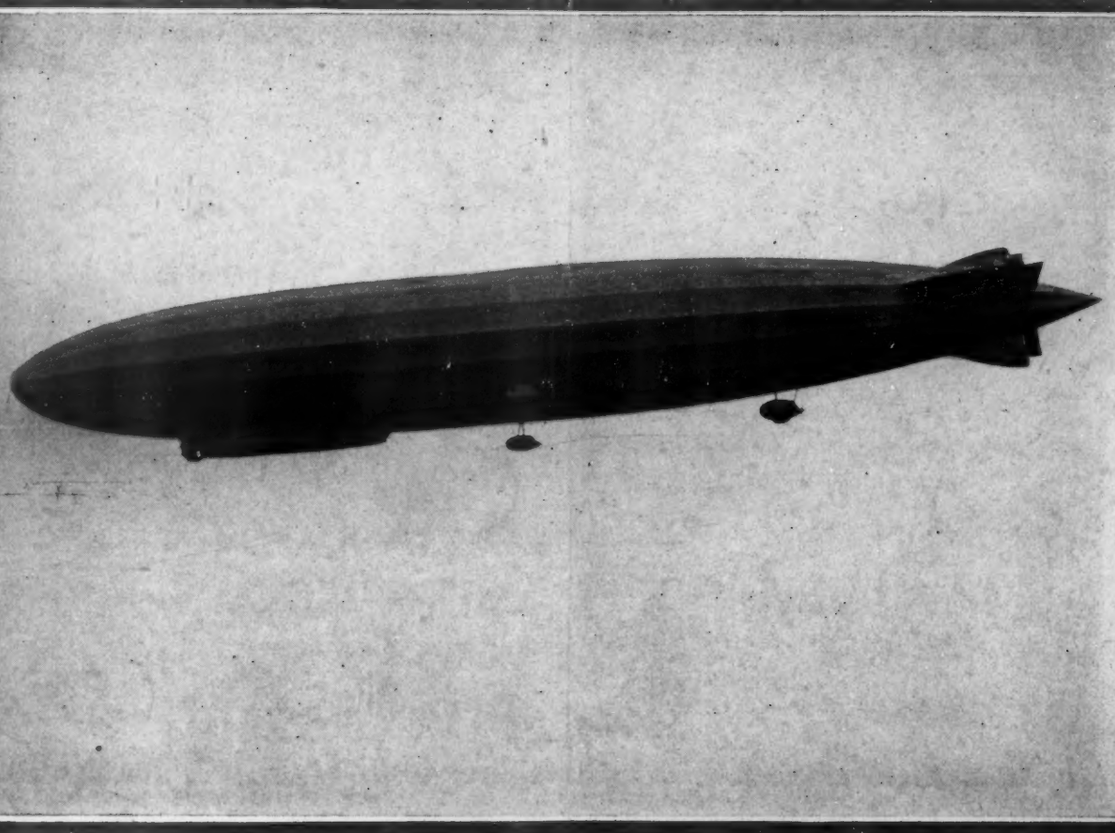
# AVIATION AND AIRCRAFT JOURNAL



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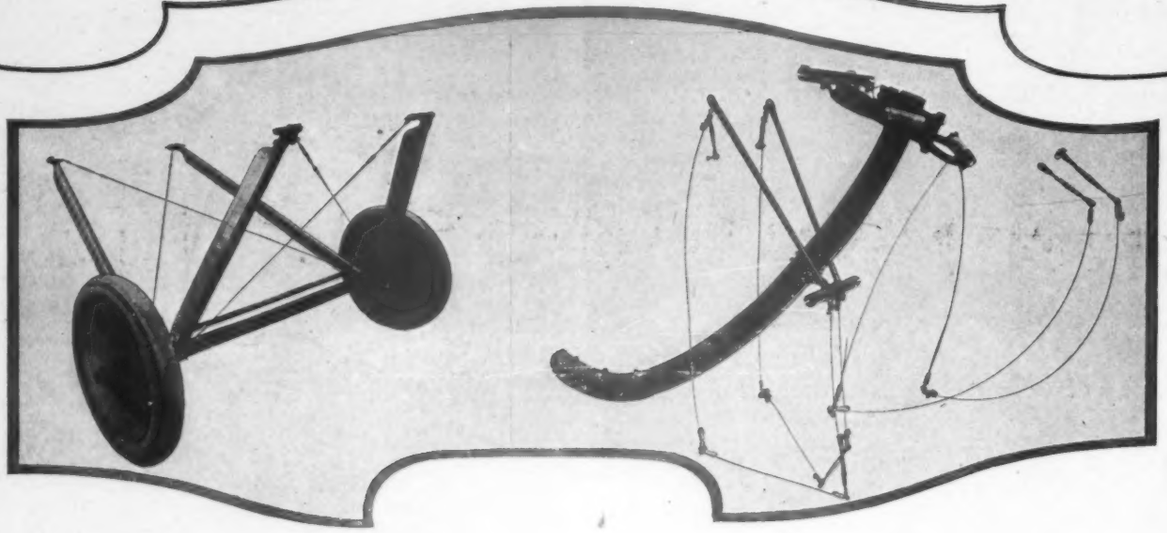

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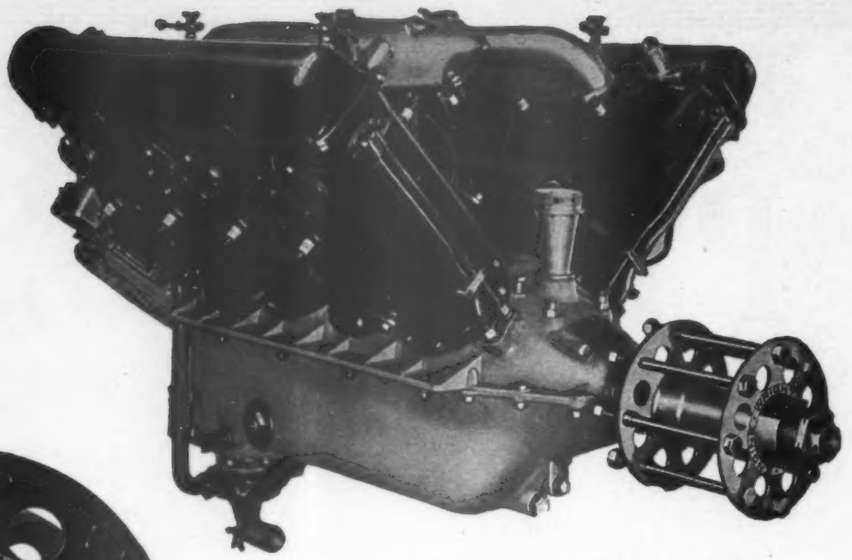

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JULY 18, 1921 VOL. XI. NO. 3

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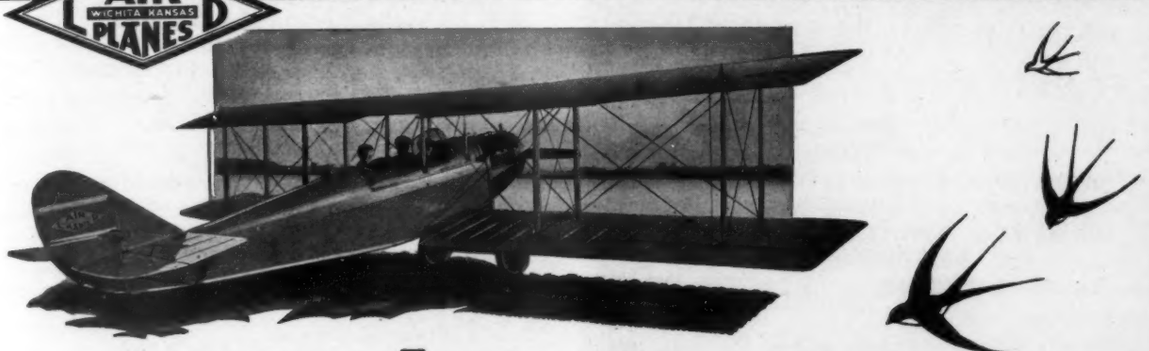


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# AVIATION AND AIRCRAFT JOURNAL

LADISLAS D'ORCY, EDITOR
ALEXANDER KLEMIN
EDWARD P. WARNER
RALPH H. UPSON, CONTRIBUTING EDITORS

Vol. XI | July 18, 1921 | No. 3

## To a Contemporary

WE take pleasure in extending congratulations to our British contemporary, *The Aeroplane,* on the occasion of its tenth anniversary. The publication has passed through periods of varied prosperity and adversity with characteristic British nonchalance.

Under the guidance of Charles G. Grey, known to his readers as the "C. G. G." of a paradoxical humor which enhances a sound knowledge of things aeronautical, *The Aeroplane* has given to the science of aeronautics contributions both substantial and brilliant, and so AVIATION AND AIRCRAFT JOURNAL extends hearty good wishes and hopes for the continued prosperity of *The Aeroplane.*

## American Aviators in Canada

FOR the third time the Air Board of Canada has extended the time limit during which certain classes of American aircraft and pilots will be permitted to enter and fly in the Dominion provided they fulfill certain requirements in accordance with the International Air Convention.

Pilots must either possess a military or a naval certificate to cross the border, which however does not entitle them to carry passengers or merchandise for hire, for their license is deemed to correspond only to the "private air pilot's license" provided for by the Convention. The countries signatory to the Convention issue to pilots of commercial aircraft a special certificate, which alone entitles its possessor to engage in commercial flying.

As to American private aircraft which cross into Canada, they must bear the nationality and registration marks provided for in the Convention, and if they are to carry passengers or merchandise for hire they must be provided with a certificate of airworthiness. As there does not exist any authorized agency in the United States for the issue of such certificates, it appears that the Air Board of Canada will provide American aircraft with temporary certificates to enable them to fly in the Dominion. Judging from the provisions of the International Convention, American pilots would likewise have to be given temporary "commercial air pilot's licenses".

We are dealing with this matter at some length not only to show the great and continued courtesy the Canadian Air Board displays to facilitate aerial relations with the United States despite the many difficulties this involves with respect to the International Convention; but also to take the opportunity for pointing out how urgent it is that Congress either ratify the Convention or else that the government enter into a separate air navigation agreement with Canada.

It should be plain to all that we cannot continue to regulate American-Canadian air traffic on the basis of provisional agreements which have to be renewed every six months just because Congress fails to show any interest in the matter. It is true that there is no Air Department or any other government agency to which American aviators can apply to end this chaotic state of affairs, for the Army and Navy are only indirectly interested in civil aeronautics. As a result no individual or agency in the United States can be held responsible for the lawless state which prevails in American aviation and which checks its healthy expansion.

It is not only in the interest of border traffic that federal air legislation is urgently needed; indeed, there is even greater urgency for its enactment on the ground of general safety, for only a federal air law can put an end to the activities of irresponsible pilots, and aircraft of doubtful age and airworthiness.

## Progress in Methods of Transport

ALL great advances in science have had opponents. The practical applications of scientific advances have depended for their success on the support of the public. This support is given when the public is educated to an appreciation of what a discovery means.

Methods of transportation in general, because the factor of personal safety is so largely involved, have been the greatest sufferers in the matter of public support. Aeronautics, in particular, is weathering the storm which its predecessors in the realm of transportation have weathered before securing the support of the public.

Sailing the seas at one time was thought to be a hazardous adventure. Crossing the ocean under steam power was once thought dangerous. Riding in a railway train; motoring; travelling in the subway, or in the tunnels under the rivers have all been thought dangerous in their respective periods of introduction.

The public thinks differently now. Education has shown advantages to outweigh disadvantages For that reason people still travel by the recognized methods of transportation, despite casualties due to ships sinking, trains colliding, and motor cars overturning.

Aeronautics as a method of transportation is in its infancy and will survive as all preceding methods of transportation have survived. The dominating factor in its survival will be speed.

In considering the existing methods of transportation it is of interest to notice two facts. One is that each method has provided more speed than its predecessor. The other is that each method has not supplanted any other, but has fitted into its proper place in the whole scheme.

So will it be with aeronautics. Speed will make it survive, and it will supplement other methods of transportation by taking its place where it is most needed.

Before this is attained, however, blunders will be made and accidents will happen with their consequent casualties as they have throughout the history of the development of all methods of transportation.

# Requirements of Commercial Airplanes

## Report of the Safety and Economy Committee of the Royal Aeronautical Society of Great Britain

The following report by the Safety and Economy Committee of the Royal Aeronautical Society is based on practical observations drawn from the operation of the London to Paris commercial air services. In making this investigation it was thought desirable that designers of airplanes and aircraft engines should be enabled to hear a summary of views upon the actual running of commercial services, notably on the impediments to providing a service which was safe and reliable, but bearing in mind the fact that such a service could not survive without showing a prospect of financial return.

The various factors which had militated against reliability are discussed in the following relative order based upon their order of importance: (A) Installation work on engines, oil, water and fuel systems. (B) Engine design. (C) Airplane design. (D) General—weather reporting, etc.

### A.—*Installation Work on Engines, Oil, Water and Fuel Systems*

It became clear that failures in the engine itself, as compared with a group of effects which may be described as "faulty installation" (including pipe work, fuel and oil supply, ignition and cooling systems, etc.), formed a small percentage of the causes of forced landings. The present-day aero engines may be called reliable in contrast with these other items. The wear on working parts gives rise to expense which is relatively small and, therefore, has far less effect on the economies of working than is commonly supposed.

*Cleanliness.*—A potent cause of breakdown, owing to its interference with inspection of pipes, carburetor, ignition system, etc., is the discharge of oil from breathers, leaks, bearings, etc., which occurs when the engine is in the air and which escapes the engine designer's observation owing to the difference of conditions between the test bench and the scheduled flights of a service. This detail was proved to be serious, and it is therefore recommended that:—

1. *All oil leakage and spray should be eliminated.*

As one example, crankcase breather pipes should be led to the air intake of the carburetor, or other such appropriate place.

*Fuel Feed.*—In considering fuel supply systems it was felt that the existing objections to pressure systems is appreciably an aftermath of war conditions, when puncture by bullet through a pipe or tank had to be guarded against. For commercial flying the pressure system has certain merits: for example, it facilitates a disposition which increases safety from fire, namely, placing fuel tanks on the wings, an arrangement which may also be so disposed as to simplify the process of refueling. It is therefore recommended that:—

2. *While the gravity feed and pump systems are not objected to, the pressure system is capable of useful service and should be permitted to develop by release from prohibition.*

*Fuel Filters.*—It is agreed that the proper filtration of fuel before it reaches the carburetor is essential, and it is thought that the design of a suitable filter to form an intergal part of the fuel supply system has been proved by practice not yet to have received the attention it deserves. A better solution of the problem of filtering is to achieve this continuously during the hours of running, rather than attempt to do it rapidly when filling the tanks. It was agreed that such filters as are at present in use in civil aircraft are mostly neither accessible nor adequate, and accordingly it is recommended that:—

3. *One fuel filter fully accessible and fully adequate should be a permanent item in the fuel system.*

*Fuel Gauges.*—The pilot must have knowledge at any given moment of the amount of fuel in his tanks. At present this is left too much to estimation, which cannot take account of such incidents as small leaks or flooding of the carburator. It is believed that the difficulties of designing such a gauge as is indicated in the recommendation are not insuperable, and it is recommended that:—

4. *Urgent efforts should be made to produce a satisfactory distance-reading fuel guage, and when this is available it is of great importance to safety.*

In many cases a distance-reading guage is not required, and therefore the provision of a thoroughly reliable guage is a simple problem. In such cases a guage should be made compulsory.

*Fuel Pipes.*—The practice of inserting small lengths of rubber tubing in the run of fuel pipes has, it is believed, been already objected to by the Fire Prevention Sub-Committee of the Aeronautical Research Committee, and it is desired to endorse such an expression from the point of view of reliability as well as that of safety, and the Committee therefore advise definitely that:—

5. *The use of rubber connections in fuel systems be discouraged with a view to eventual abolition.**

They have considered the objection to copper pipes, and recommended the development of:—

6. *The use of soft steel pipes for both fuel and oil systems.*

Their use on other vehicles has been found satisfactory, and through one of their members the committee have obtained in this connection a drawing of the vibration bend formed in such pipes by the London General Omnibus Co., who, it is understood, do not specify any particular steel, but purchase solid-drawn mild steel tubing from stock, but require, however, the entire length of the pipe to be annealed after bending.

*Engine Cowlings.*—Evidence has been received that in the past sufficient attention has not been given to cowling from the point of view of making the engine readily accessible for small adjustments, repairs and inspection and cleaning, and it is recommended that:—

7. Engine cowlings should be completely dismountable or *replaceable in three or four minutes without the use of tools, and in such a way as to leave the engine and accessories completely clear.*

*Magneto Accessibility.*—The committee desires to accentuate the often disregarded canon that:—

8. *Magnetos should be readily removable and easily replaced correctly.*

*Duplication of Ignition.*—Even admitting that magnetos are becoming more reliable and that there are certain coil systems which have also been proved serviceable, it is felt that the added security against forced landings from ignition failure warrants the recommendation that:—

9. *All engines should have duplicate ignition.*

*Radiator Size.*—The committee feel that a rule such as has existed hitherto requiring a definite area of cooling surface for each horse-power is undesirable. Inducement to improvement in design of radiator systems is thereby lost, and in certain cases the rule is detrimental as calling for unnecessary weight. Some difficulty arises from the fact that the radiator is not designed by the engine maker, though this may be inevitable at present. They feel, however, that it would assist radiator design if the maker were given the rate of heat flow and other supplemental data demanded by the engine at full power. Bearing this suggestion in mind, it is recommended that:

10. *The rule for compulsory raditor area for a given engine power should be abandoned for civil aircraft.*

*Engine Starting.*—Some reference is needed to the present unsatisfactory method of starting the engine by swinging the propeller: an inefficient and dangerous proceeding. As the question of providing engine starters integral with the airplane—whether electrical, mechanical, or on the compressed air system—is rather one for invention and ingenuity than

* See Aeronautical Research Committee, I.C.E. Report No. 703, "Metallic Couplings for Petrol Pipes," by Squadron-Leader G. H. Norman, R.A.F., and I.M. 1011. "Flexible Joints and Couplings (Instructions on Connections)."

for the committee to deal with in detail, they recommend in general terms that:

11. *Every possible step should be taken to render propeller swinging unnecessary.*

### *B.—Engine Design*

*Test of Power Plant Complete.*—As previously stated, the majority of engine stops are due to faults in installation and accessories rather than to engine design. Accordingly the opinion is put forward that bench tests, though essential for engine development, are not the ideal method of testing the aero engine for use. The standard 50-hr. continuous run test does not sufficiently reproduce the number of intermittent runs with an enforced period of idleness between each called for by the routine of commercial work, where starting to schedule time is vital. The expense involved would, however, render impossible any such severe test as a minimum of 10 hr. run a day divided into four equal periods, and persevered in for 200 hr. in all, as was suggested by one of the chief users of commercial craft. It is therefore recommended that:

12. *A test consisting of a number of consecutive periods of, say, 2½ hr. each, with strict adherence to schdeule time for each start, and with one working hour interval between each, should be introduced into the existing 50-hr. type test for engines; moreover, a full test should be made of the complete power plant and accessories as installed in the airplane in a trial flight.*

*Starting Up.*—The wasteful practice of running an engine for a quarter of an hour or twenty minutes before opening up to full throttle was questioned as uneconomical. Evidence seemed to show that the practice was largely habit, and the danger resulting from opening up with the engine cold related chiefly to the oil gauges, an objection which could be overcome by suitable instrument devices. The precautions necessary for ascertaining that everything is in order can be taken by the pilot or others with him before starting his engine and, therefore, though the pilots must not believe that they can start without making a thorough examination, it is recommended that:

13. *Engines should be so designed and arranged to open up to full throttle within a few minutes of starting.**

*Type of Engine.*—The question of whether one type of engine is markedly superior led the committee to discuss the relative merits of the three existing types: (*a*) One cylinder per crank; (*b*) two or three cylinders to each crank, and (*c*) all cylinders to one crank. The prospects of considerable saving in weight favors the latter type, while type (*a*) at present carries the advantage of lower cost of upkeep. It does not appear, so far as existing designs are concerned, that any one of the three types can be said, as such, to have any preponderating advantage over the others, and the committee therefore records its view that:—

14. *No one of the three types of engine can be given any particular expectation of preference for commercial work; but there is need of financial support to preserve the existing state of knowledge on engines with all cylinders to one crank, which is in a promising state of advancement.*

*Fuels.*—Inasmuch as engine improvement would be largely assisted by the classification of fuels in accordance with their tendency to detonate, and research work in this direction is required, it is recommended that:

15. *Fuels should be classified in accordance with their tendency to detonate—say, by their toluene value.**

*Compression Ratio.*—Attention is drawn to the fact that the compression ratio required for military purposes, owing to the flying height adopted, is different from that necessary for commercial purposes, where a machine must be able to fly at full throttle close to the ground continuously in bad weather. As there is not at present an adequate demand to specialize *ad hoc* the designing of aero engines for commercial as opposed to military uses, the committee indicate that:

16. *Engine design should allow of the modification of the compression ratio within a wide range by simple alteration at the maker's works, so as to be able to take advantage of foreseeable improvements in fuel.*

* See Aeronautical Research Committee, I.C.E. Report No. 53, "Type and Life Tests on New R.A.F. Standard Accumulators for Engine Starting," by Capt. A. L. Davis.

*Springs.*—The variation in the behavior of springs which are visually identical appears to be due at present to the reliance of the maker on the estimate of the skilled manual worker rather than on a scientifically precise treatment of the spring material. In view of the fact that failure of a valve or other spring may on occasion cause an engine stoppage, it is recommended that:

17. *Research is desirable on the manufacture of springs, in order to bring mechanical differences within small and reliable limits of variation.*

*Propeller Revolutions.*—In view of the increased efficiency of propellers running at low speeds and the consequent gain in effective horse-power without sacrifice in fuel, and after considering the permissible increase of propeller diameter, the Committee puts forward for consideration that:

18. *For commercial purposes and specifically with a view to a steep angle of climb in getting off, engine design should provide for a slow speed of revolution of the propeller, not exceeding, say, 800 to 1,000 per minute for an engine of 500 or 600 h.p. when flying all out.*

Analogous rates of propeller revolution for other sizes of engine could be calculated on the basis of some such formula as $\frac{20{,}000}{\sqrt{\text{H.P.}}}$

*Repairs.*—On the subject of removability for repairs, the Committee considered communications by Captain Barnwell and Colonel Fell. The former envisaged standardizing the provision made on the engine for attachment to the fuselage, and the latter making the forepart of the airplane detachable as a unit. It was felt that the time has not yet arrived for delimiting by a standard the unforeseeable developments of commercial craft. In regard to the latter suggestion, it appears that it would be difficult for the airplane designer to give so much information to the engine designer, notably since the engine takes much longer to evolve than the aircraft, and there would also be difficulties in connection with the cowling to fit into the fuselage of different types of machine. Nevertheless much can and should be done by foresight in design to make engines readily removable, and it is recommended that:

19. *The attention of designers should be drawn to the desirability of so fixing the engine installation (comprising, if possible, carburetor, ignition, cooling and oiling systems) that it is easily removable as a unit.*

*Arrangement of Power Plant.*—In order to keep a clear practical view of the problem of London-Paris transport and solely to form some opinion as to the size, number and disposition of engine suitable (and expressly disclaiming any selection of this as the most suitable machine for the purpose) the Committee took as a (to some extent arbitrary) basis for discussion an airplane carrying ten 200 lb. passengers (implying a gross weight in the neighborhood of 7,000 lb.) at a cruising speed of 95 m.p.h., with an engine loading of 14-16 lb. per horsepower, and using the R.A.F. 15-wing section. The question was the most suitable form, etc., of power plant, and the recommendations are expressed in relation to the example above selected.

The consensus of opinion was that such an aeroplane would require power plant to develop 450 hp. on a climb (i.e., about 500 hp. at full power).

It was agreed that:

20. *The thrust should be central whether one or more engines be used.*

There would be no advantage, pending the development of a variable pitch propeller, in having two engines coupled together driving one propeller, as in the event of failure of one engine the thrust would fall, say to 1/3 of that obtained with both engines running, and be insufficient to maintain level flight.

It was felt, however, that if a single engine be used, it should be the aim of designers to make the power plant more

* See *The Automobile Engineer* for February, March and April, 1921: (*a*) "The Character of Various Fuels for Internal Combustion Engines," by H. T. Tizard and D. R. Pye; (*b*) "Influence of Various Fuels on Performance of Internal Combustion Engines," by Harry R. Ricardo. Also Aeronautical Research Committee, I.C.E. Report No. 57. "Detonation in Internal Combustion Engines," by Harry R. Ricardo; and I.C.E. Report No. 46, "Effects of Changes in Power-Weight Ratio and Fuel Economy, with special reference to High Flashpoint Fuels," by Major B. C. Carter.

reliable than is the case at present. It is therefore recommended that:

21. *At or about the size of this airplane a single engine is preferable to two coupled together.*

And moreover (without entering into the details of the reward or inducement required) that:

22. *It is desirable to provide designers of engines for commercial purposes with a much greater incentive for securing increased life than is given to-day.*

*Engine Room.*—The Committee further recommend that:

23. *Where one engine only is used, the advantages offered by an engine room do not appear to warrant its adoption.*

*Duplication of Engines.*—In connection with recommendation 21, it is felt that, since a single engine may fail, a reserve which would avoid complete loss of power without great increase of weight and without abandoning the central thrust, while yet keeping the two engines and their propeller drive completely separate, is an objective worthy of careful study. It is therefore felt that:

24. *A desirable type of machine would be one equipped with two engines in such a manner that in the case of one cutting out there would be no interference with the other and no additional turning tendency of the airplane to be counteracted, and that level flight would be maintained.*

A method discussed was to mount two totally independent engines in a central fuselage, with each engine driving its own propeller, the propeller shafts being concentric and the fuel suppies independent.

### *C.—Airplane Design*

*Testing.*—The Committee recommend that:

25. *During the test mentioned in recommendation 12 all the flying qualities (e. g., trim, control and stability) of the airplane should be observed and found satisfactory.*

*Control.*—A large item of the expenditure in running a commercial airplane service is the renewal of control cables. As it is only a very small portion of their length that becomes worn—mainly owing to friction from passing through fairleads or over pulleys—it is recommended that:

26. *Control cables should not pass through fairleads or pulleys; or, if so used, the part so passing should be separately renewable and be fitted with an adjuster. The design of controls should, further, be such as largely to reduce the proportionate effect of the cables stretching under load.*

It is noted that in the present design the relation of the amount of movement caused by stretch to the total movement is excessive. Moreover:

27. *It is desirable to lighten the control effort at normal flying speeds and increase the magnitude of the control effect at low speeds.*

To exemplify the meaning of this, the employment of variable gear ration throughout the range advocated, the gear being lower in the central portion of the range and higher at the extremes.

The Committee recommend in general that:

28. *The solution of the problem of retaining control for alighting at or below the stalling speed calls for urgent study and research both in the laboratory and on the full scale.*

In this connection it is also recommended that:

29. *Closer attention should be paid to the proportion of ailerons, as a considerable amount of recent information on this subject is now available.**

*Undercarriages.*—For economical reasons on schedule services it is desired that the undercarriage should form a unit readily separable from the fuselage for replacement. Experience shows that serious loss of earning capacity is occasioned by the lock-up of machines for undercarriage repair when the rest is undamaged. To facilitate the moving of airplanes on the ground with a small ground staff is an analogous requirement, and therefore it is recommended that:

30. *The undercarriage and tail skid should be easily dismountable and replaceable, and for facility of handling on the ground the tail skid might be replaced by a steerable wheel capable of being braked.*

Further, it is recommended that:

31. *A design of undercarriage with much greater capacity for absorbing energy without restitution, while leaving sufficient springing for taxi-ing, should be studied.*

(It is to be noted that the pneumatic tires now used absorb and restore too much of the energy.)

And that:

32. *The airplane should be so designed that failure of the undercarriage does the minimum of damage to the fuselage.*

As an example of what is here intended may be mentioned the use of a universal joint at the top of the undercarriage struts, such that, in the event of the undercarriage collapsing entirely, damage to the longerons may be avoided.

*Propellers.*—The use of two-bladed propellers leads to vibration while on a turn or if the axis is not parallel to the line of flight, and it is considered that:

33. *The fitting of propellers with more than two blades is desirable.*

It is also considered that:

34. *The fitting of propellers with detatchable blades, preferably adjustable as to pitch, is worthy of development for its economic advantages.*

*Reduction of Resistance.*—It has been represented that in the light of present knowledge sufficient importance is not always assigned to the necessity for good streamliming of all parts of an airplane, and the Committee therefore recommend that:

35. *Attention should be paid in the original design to the reduction of resistance and keeping all excrescences to the minimum.*

It is understood for example, the designing of the wing abutment in such a way as to fair off into the fuselage will in certain cases effect a considerable reduction in resistance.

*Pilot's View.*—The necessity for an adequate field of view for the pilot, not only forward, but also to the sides and behind, though studied in some designs, is neglected in others. As flying increases in volume the risk increases. If collisions are to be avoided, it is of extreme importance that the pilot should have an appropriate field of view in each direction. It is thought that at present there is no authority to enfore this and to effectively warn off an airplane, whether British or foreign, which might be known to be dangerous. Accordingly, is is recommended that:

36. *Powers should be taken to secure by regulation or inspection the provision of a proper field of view for the pilot.*

*Emergency Exits.*—It is not always possible for passengers to make their exit from airplanes in certain positions, in the event of a crash, and even where it may be possible to escape by making a hole in the fabric covering the fuselage experience shows that passengers are not aware of this fact. It is recommended that:

37. *The provision of emergency exits for rapidly discharging passengers in the event of a crash, in whatever position the airplane may be, and the notification of such means of egress, should be made compulsory.*

*Fire Prevention.*—In view of the work in hand of the Committee specifically studying this subject of fire precautions, the question is not here entered upon, though attention is called to its importance.

*(To be continued)*

## Aeromarine U.S.D. Engine Completes 50-Hr. Test

The Aeromarine, Type U.S.D., 8 cylinder engine has just completed a successful 50-hr. test by the Engineering Division at McCook Field. This engine has a bore of 4¼ in., a stroke of 6½ in. and a total piston displacement of 738 cu. in. The weight is 567 lb. dry. The normal power output is 190 hp. at 1750 r.p.m. but the engine will be choked down to 160 hp. at 1600 r.p.m. for training purposes. This engine possesses several original features of design. The water jackets of the two cylinder blocks are cast integral with the upper half of the crank-case. The cylinder sleeves are steel tubes which are inserted in the jackets from the top. A removable head is used for each cylinder block consisting of an aluminum casting with cored water passages and steel inserts for the valve seats. The removable head will, undoubtedly, prove a great convenience in the maintenance of this engine, as it can be removed for valve grinding in a very few minutes. It will also be possible to remove the head and replace it with another in which the valves have been ground without removing the engine from the airplane.

# The Saulnier Three-Engined Monoplane

Raymond Saulnier, chief engineer of the Morane-Saulnier Airplane Co., recently completed the plans of a three-engined monoplane which embodies many novel features. The machine is now under construction, in part at the Morane-Saulnier factory, and in part at the plant of the Lorraine-Dietrich Co. The latter firm will probably supply the engines for the power plant, although it is possible that three 400 hp. Liberty engines will be used instead. The Loraine-Dietrich engines which it is intended to use develop 370 hp. each.

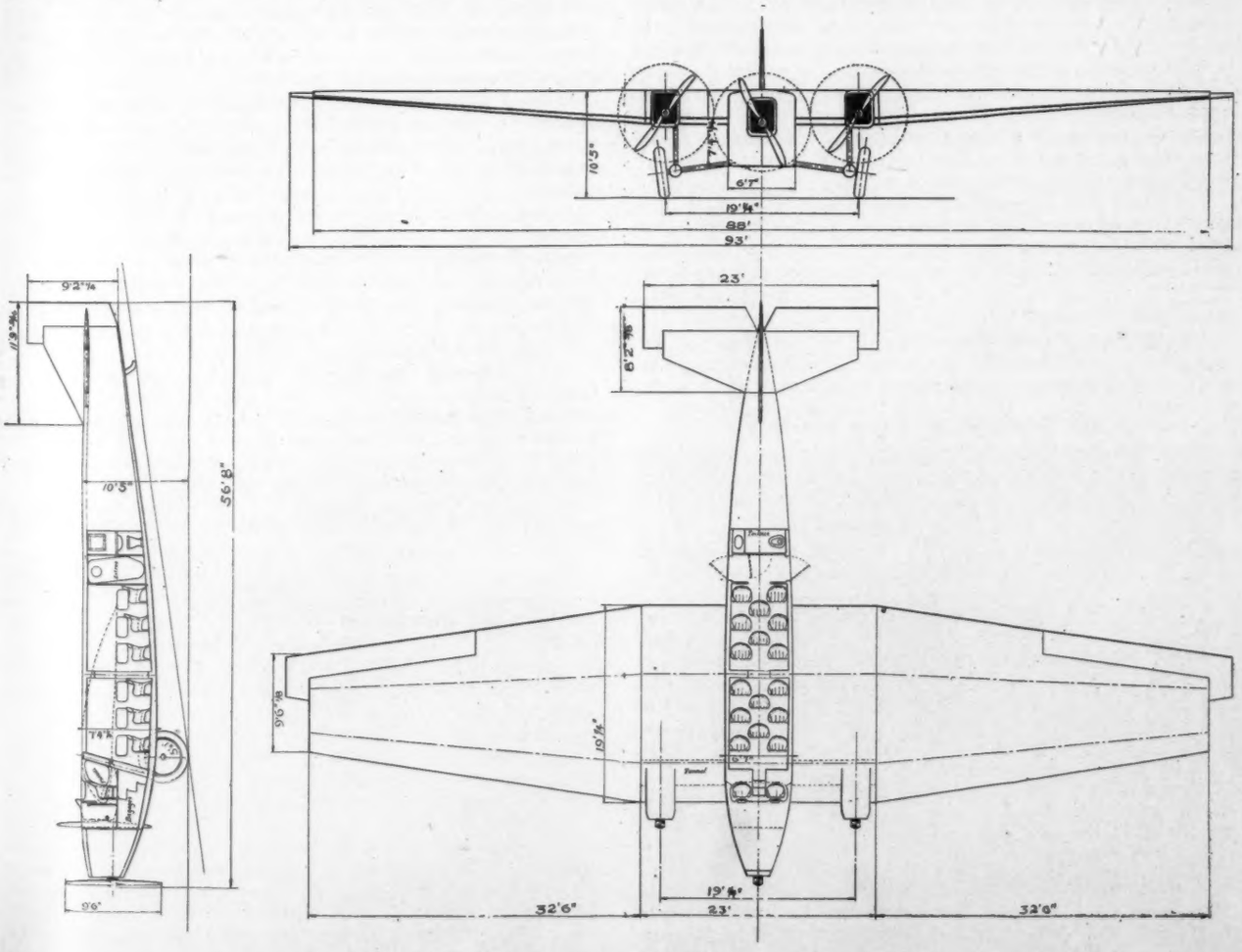
As may be seen from the accompanying outline drawings, the new machine is a thick wing cantilever monoplane with a central engine mounted in the nose of the fuselage and two outward engine nacelles. The form of the wings is noteworthy, the center sections being of uniform chord and depth, while the outer sections taper towards the tips both in chord and depth. All the control surfaces are balanced. The engines are spaced in such manner as to prevent "blanketing" of the respective propeller disk areas. A tunnel leading from the control cockpit to both wing engines enables the mechanic to make minor adjustments while the machine is in flight, while the central engine may be directly reached from the control cockpit. The fuel tanks are situated in the depth of the wing just aft of the outboard engines, no fuel being carried in the fuselage. Provision is made for the immediate emptying of the fuel tanks should the necessity arise. The normal fuel capacity is sufficient for a 7-hr. flight with full load.

The fuselage is of rectangular section amidwings, tapering forward into the central engine mounting with a square honeycomb radiator, while aft the fuselage tapers toward a vertical knife edge which carries the monoplane tail unit. The control compartment is fitted with two seats abreast of the wings, affording excellent all round visibility. Under the control cockpit there is a baggage room and aft of it is a spacious passenger cabin, seating sixteen persons in three rows. Access to the cabin is had by means of two side doors aft of the seats, behind which a wash room is provided.

The structure of the machine is entirely built up of metal elements, the surfacing of the wings and fuselage alone being of fabric. The wing spars are duralumin lattice girders. The entire structure has been exhaustively tested at the Eiffel laboratory and so has a scale model of the machine. According to L'Aérophile, to whom we are indebted for much of the information to hand, the wind tunnel tests have given the best aerodynamical results ever registered at the Eiffel laboratory. The model used for the tests was on the scale of 10/338 and the results obtained were as follows ($K_x$ and $K_y$ being expressed in gram meter seconds):

| Incidence | -5° | 0° | 5° | 10° |
|---|---|---|---|---|
| $K_x$ | 22.1 | 23.5 | 40.1 | 71.1 |
| $K_y$ | 47.5 | 192.3 | 424.6 | 652.7 |
| $\frac{K_x}{K_y}$ | 0.122 | 0.944 | 0.1089 | |

The best value of $\frac{K_x}{K_y}$ is 0.093, which was attained at an angle of incidence between 2 and 3 deg. The accompanying graph shows the relative performance of the Saulnier three-




OUTLINE DRAWINGS OF THE R. SAULNIER THREE-ENGINED MONOPLANE

engined air-plane according to wind tunnel tests and that of the Staaken-Zeppelin four-engined airplane. The later is equipped with four 260 hp. Mercedes engines.

The weight empty of the Saulnier airplane, as designated, is approximately 9500 lb., of which 4400 lb. represents the weight of the engines. The designated useful load is about 6000 lb. so that weight loaded will be 15,500 lb. The machine was designed to fly with full load on two engines only, in which case the horizontal speed is decreased. With three engines running,

PERFORMANCE GRAPH OF THE SAULNIER (FULL LINE) AND STAAKEN-ZEPPELIN (BROKEN LINE) AIRPLANES

the ceiling at full load is over 15,000 ft., and the maximum horizontal speed 150 m. p. h. Carrying 5 hr. fuel and oil, a pay load of about 3000 lb. can be carried a distance of 600 miles.

The technical section of the French air service has already placed an order for one machine of this type with which extended experiments will be carried on.

The general charastistics of the Saulnier three-engined airplane are as follows:

GENERAL CHARACTERISTICS OF THE SAULNIER THREE-ENGINED AIRPLANE

| | |
|---|---|
| Span | 93 ft. |
| Length overall | 56 ft. 8 in. |
| Height | 10 ft. 5 in. |
| Chord, maximum | 19 ft. ¼ in. |
| Wing area | 1,300 sq. ft. |
| Engines | 3,500 hp. Liberty |
| Weight empty | 9,500 lb. |
| Weight loaded | 15,500 lb. |
| High speed | 150 m.p.h. |
| Ceiling | 15,000 ft. |

## Air Transport in Latin America

*Mexico.* Plans will soon materialize for a commercial air service between Cuidad Juarez and Chihuahua City. The distance between these two points is 226 miles by rail, and the journey takes 10 hrs. The wagon roads are so bad that a long detour through Fabens, Tex., is necessary and even with a good automobile it takes about 12 hrs. to make the trip. The airplanes of the new service will easily make the journey in two hours. It is proposed later, states Consul J. W. Dye, to make special flights throughout the State of Chihuahua for the accommodation of mine owners and others. American planes piloted by Americans will be used and pending the selection of a landing field at Juarez, permission has been granted for the use of Fort Bliss, near El Paso, Texas, across the border from Juarez.

*Bolivia.* Bolivia was among the earlier South American supporters of aviation, especially for commercial purposes. Toward the end of last year the government formed the first school of aviation, contracting with Lieut. Donald Hudson, an American aviator, to act as director of the Institute. Since then, the Administration has maintained its interest in aerial transportation. A recent action has been the recognition of, and support for, a new aviation society known as La Sociedad Boliviana de Transportes Aeros, which has been formed upon an ambitious scale to promote commercial aviation throughout the country. The government has given to the new undertaking the right to operate an air-line between Cochabamba and Santa Cruz. For this purpose there will be put into use four triplanes of the newest type, capable of carrying ten passengers and a ton of cargo, the journey between the two points mentioned being estimated to occupy six hours. The headquarters of the new aviation society will be established at Cochabamba.

*Colombia.* The Republic of Colombia is also commercially interested in the regulation of aviation, in which a number of foreigners are taking active part. The government has now issued a decree which classifies privately-owned aircraft into two sections according to their use, either as touring or commercial aircraft. All flying machines entering the country are registered, and the utmost care taken to see that no flights are undertaken until the machine has been thoroughly tested. Aircraft which are the property of the government are to be employed exclusively for military purposes, carrying the mails, for the customs, and police forces. Private aviation companies already established or to be established in the territory of the republic will be considered as national, while all private aircraft, whether used for touring or commercial purposes, will bear the same designation. Private aircraft companies will be obliged to give a declaration to the ministry of war to the effect that they will comply with the rules for aviation now accepted.

German capital has already been interested in connection with commercial flying, a company subscribed to by local Germans having a capital of $100,000. It is proposed to extend the local service, which hitherto has not done very much in the direction of practical flying, from Barranquilla as far as the Dutch Port of Curacao, opposite the territory of Venezuela. Each machine is destined to carry five passengers and a ton of cargo. Planes have been purchased upon the recommendation of Herr Kamerer, an aviation engineer, under whose instruction also hangars and workshops have been partially completed at Barranquilla. In the meantime arrangements are being made to inaugurate an airplane service between Barranquilla and Girardot, about 700 miles up the Magdelena River, a journey which is expected to occupy nine hours, including a number of short calls at various towns passed en route. This service will be for both passengers and cargo.

*Brazil.* An important aerial transport company has been formed at Rio Grand de Sul, for the purpose of assuring a regular transport service for passengers and freight between Rio Grande and various centers in the neighboring states. The machines for this service are of French manufacture.

## Aerial Photography and Agriculture

For the purpose of demonstrating the many uses of aerial photography in farm management and agricultural development, First Lts. George W. Goddard and Howard K. Ramey, Air Service, were ordered, on May 18, to proceed by airplane from Bolling Field, Anacostia, D. C., to Amherst, Mass., for the purpose of making mosaics of the territory in the vicinity of the Massachusetts Agricultural College.

The itinerary of the flight was: Bolling Field to Mitchel Field, Long Island, thence to Amherst, thence to Boston, thence to Portland, Maine.

The flight from Washington to Portland was made in five hours, and the total time consumed in performing the photographic reconnaissance was nine days from time of departure to return.

Mosaics were made from an altitude of 12,000 ft. for the Agricultural College at Amherst of 175 square miles of territory, the time consumed in taking the photographs being two hours. Mosaics were also made of Portland and of Boston showing the docks at both points.

This work was done by the U. S. Army Air Service in cooperation with the Agricultural Department, Amherst College, and the Shipping Board. In the short time consumed in performing the work and the completeness of detail as shown by the mosaics produced, demonstrate the value of aerial photography in agricultural development and engineering enterprises.

# Canada's Commercial Air Policy

In reply to numerous inquiries received by the Air Board of Canada regarding the present and future prospects of civil aviation development in the Dominion the following statement appears in General Progress Report No. 7 (May 1921) issued by the Air Board of Canada:

The Canadian government fully realizes the importance and ultimate possibilities of civil aviation in a country like Canada and has adopted the policy of encouraging it along the following lines:—

(1). The regulation of civil flying, the inspection and registration of machines, certification of personnel, and the inspection and licensing of airharbors, on the principles laid down by the Convention for International Air Navigation.
(2). The establishment of a Technical Branch under the Air Board, the services of which are freely placed at the disposal of promoters of air undertakings.
(3). The survey of air routes and the provision on recognized air routes of emergency landing grounds, where necessary, between urban centers along any route.
(4). The establishment of an Operations Branch which confines itself to the carrying out of such flying operations with heavier-than-air machines as are required for the various departments of government in relation to forests, fisheries, surveys, customs, etc., and to scientific experimental work.
(5). The loan of airships and lighter-than-air equipment to commercial companies.

The Canadian government has not undertaken to subsidize directly any commercial air service. The view taken has been that such services were not at present likely to be profitable in Canada if operated independently of the existing railway and steamboat companies. The railway and steamboat connections between large centers in Canada are efficient and an air competition, if it involved the maintenance of expensive administrative and auxiliary departments, has been thought likely to be unprofitable. Existing transportation organizations have, on the other hand, not shown any desire to establish their own air services. There is, moreover, an independent field for air operations in the sparsely settled and undeveloped portions of Canada in which at present communications are inadequate. Exploration and communication services by aircraft in these areas depend chiefly upon timber, mining or like enterprises which, if adequately financed, can, with the assistance of the Technical and Operations Branches of the Air Board, operate advantageously and profitably. Such individual interests do not, however, justify direct assistance on public grounds.

To sum up, the view of the Canadian government has been that commercial aviation can for the present be best encouraged and developed by administrative assistance and the provision and improvement, where necessary, of ground equipment, not, however, including terminal airharbors serving urban centers. There is a probability that, as time goes on, so many of these may be required that for the government to undertake the provision of some of them, would have the effect of stifling local effort and thus hinder rather than advance general development.

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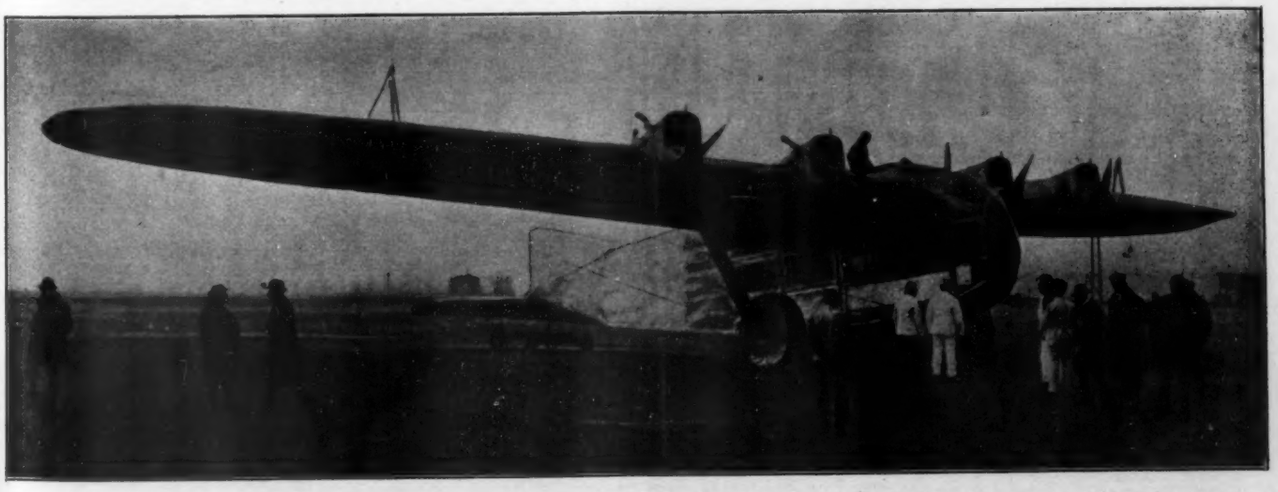
### American Civil Aircraft in Canada

The Air Board, Ottawa, Canada, makes public the following:

At the request of the United States government, the Air Board has again extended the time limit for a period of six months during which certain classes of United States pilots and aircraft will, under certain conditions, be permitted to enter and fly in Canada, pending the organization of an official body in the United States having authority to issue civil aviation certificates and licenses in accordance with the International Air Convention. This extension of time covers the period of six months from May 1 to Nov. 1 1921.

For the information of all concerned the special conditions under which the above exemption will be allowed are requoted as follows:—

(a) Only qualified American military or naval pilots will be excepted from the provisions of Par. 33 of the Air Regulations, 1920, and then only in so far as is necessary to put them in the same position with regard to flying in Canada, as if they were the holders of certificates from the government of the United States, in accordance with the International Air Convention, that is, in the position of being entitled to fly United States Aircraft in Canada, but not to carry passengers or goods for hire.
(b). Only American aircraft which would, under the Convention relating to International Air Navigation, be registerable in the United States, will be excepted from the provisions of Para. 3 of the Air Regulations, 1920, provided that:
(1). Full particulars of the aircraft are furnished.
(2). The aircraft is marked in accordance with the Regulations with a nationality and registration mark of which the first letter is the letter "N" and the second letter is the letter "C."
(3). If such aircraft is one which under the Regulations would require a certificate of airworthiness, a temporary certificate of airworthiness is issued.
(4). In all cases the same fees are paid as in the case of Canadian aircraft.



THE FOUR-ENGINED STAAKEN-ZEPPELIN MONOPLANE REFERRED TO IN THE PERFORMANCE GRAPH OF THE SAULNIER MONOPLANE

# "Who's Who in American Aeronautics"

*(Copyright, 1921, by The Gardner, Moffat Co., Inc.)*

***Every week, AVIATION AND AIRCRAFT JOURNAL prints the biographical sketch of men who are prominent in American Aeronautics. These sketches will be published later in pamphlet form. As so many of the officers change their stations often, it is believed that a semi-annual issue will be necessary. In compilations of this character many errors and omissions occur. It will be appreciated if corrections are sent to "Who's Who" Editor.***

## John Lansing Callan

CALLAN, JOHN LANSING, Commercial Aviator; born, Cohoes, N. Y., June 8, 1886; son of Peter J. Callan and Frances (Jones) Callan.

*Educated:* Albany Military Academy.

*Professional:* 1905-1906, National Exchange Bank, Albany, N. Y.; 1911-1917, Curtiss Aeroplane Co. as exhibition pilot, instructor, both land and water planes; Chief Inspector, Inspector of Construction of planes for Army and Navy; Sales Department, and representative in Italy, assisting in the organization of a factory in Italy for the manufacture of Curtiss machines.

*Aeronautical Activities:* Commenced flying in 1911; exhibition pilot and instructor on aeroplanes and seaplanes from 1912 to 1914; 1914-1916, representative for Curtiss Co., in Italy. During part of this time acted as instructor and patrol pilot for the Italian Navy and assisted in organization of flying school at Toranto; Inspector of Army and Navy planes for Curtiss Co. winter of 1916-1917 and connected with the Sales Department.

*Flying Rating:* F.A.I. No. 102, U. S., 1912; F.A.I. No. 318, Hydro., Italy, 1918; F.A.I, Hydro Superior License, Italy, 1918; Naval Aviator, U. S., No. 1442, 1918.

*War Service:* Duty U. S. S. Seattle, 1917; escorted first convoy of troops to France, June 1917; 1917-1918, duty in Italy, commanding Air Stations, in charge of training schools, and Commander of U. S. Naval Aviation Forces in Italy; 1919, Aide for Aviation in Italy; member of the Technical, Legal, Financial, and Commercial committees for aviation of the Peace Conference; promoted to Lt. Commander, March 1918 and to Commander, May 1919.

*War Honors:* U. S. Navy Cross; Knight of Order of Saints Maurice and Lazzarus (Italian); Italian War Cross; Italian Campaign Medal.

*Member:* American Society of Naval Engineers; Aero Club of Aemerica; Society of Automotive Engineers; Army and Navy Club (Wash.); Hammondsport Club; American Legion.

*Present Occupation:* Keuka Industries Inc.

*Address:* 20 Lake Street, Hammondsport, N. Y.

## Clifford Albion Tinker

TINKER, CLIFFORD ALBION, Lieut., U. S. Navy; born, West Tremont, Me., June 4, 1877; son of James Tinker and Sadie Abbie (Dolliver) Tinker; married, Harriet Elizabeth Bates, Aug. 15, 1906.

*Educated:* Public schools, Bangor, Me.; 1899-1902, Massachusetts Agricultural College, Amherst, Mass.

*Professional:* 1902-1906, Ass't. Engineer, Westfield, Mass.; 1906-1917, practicing structural engineer, built foundries, shops, woolen mills, wire mills, hydro-electric plants, water works and street railways.

*Aeronautical Activities:* 1917-1921, Naval Aviation, organizing aviation mechanics schools; organized assembly and repair section, Naval Aviation in Europe; enrolled technical personnel; later, first Ass't Chief, Assembly and Repair Section; duty at Navy Dept., Information Section, Naval Aviation; now engaged in writing official history of naval aviation in world war.

*War Service:* 1917-1919.

*Member:* Royal Socities Club, England.

*Present Occupation:* Naval Reserve Officer.

*Address:* Navy Department; home 1831 Monroe St., N. W., Washington, D. C.

## Lester Evans Shealy

SHEALY, LESTER EVANS, Commercial Aviator; born, Little Mountain, S. C., Dec. 1, 1895; son of James E. Shealy and Elvie E. (Meetz) Shealy; married, Lee Ola Sutton, March 18, 1920.

*Educated:* Public and high schools of Little Mountain, S. C.

*Aeronautical Activities:* U. S. Naval Air Forces, May 1917, Pensacola, Fla.; Squadron Engineer Officer for 15 months; flew seaplanes, boats and land planes.

*Flying Rating:* Naval Aviator.

*War Service:* U. S. Naval Air Service, May 1917 to Sept. 1919.

*Member:* Aero Club of America.

*Present Occupation:* Commercial airplane pilot and owner.

*Address:* North State Aircraft Co.; home 908 W. 5th St., Charlotte, N. C.

## George Blair Harrison

HARRISON, GEORGE BLAIR, Writer; born, Emmetsburg, Iowa, Oct. 5, 1873; son of Thomas Wentworth Harrison and Annie Wallingford (Blair) Harrison; married, Mary E. Bennett, April 18, 1898.

*Educated:* Public schools of Iowa and Topeka, Kans.; Topeka High School; Washburn College; University of Michigan.

*Professional:* Railroad or financial reporter and editor of various papers in Topeka, Kansas City, and Los Angeles, 1896-1903, and 1908-1911; with Louisiana Purchase Exposition as chief clerk and editor, 1903-1905; with California Highway Commission as chief of right of way and editor, 1912-1915; president, Pageant Film Corp., 1915-1917.

*Aeronautical Activities:* Aeronautical Editor of various newspapers; engaged in ballooning, mainly in California; instructor in Signal Corps.; received F.A.I. balloon license No. 32, 1911.

*War Service:* U. S. Army, July 1917 to 1919; commissioned 2nd Lieut., A. S. S. C., 1st Lieut., Air Service; field balloon officer at Fort Omaha, 1918-1919.

*Books:* Handbook of Aerial Navigation.

*Member:* Pacific Aero Club; Aero Club of California; Aeronautical Society of California; Air Pilots Club; Aero Club of Omaha; Aero Club of Southern California.

*Present Occupation:* Writer.

*Address:* 3526 South Flower Street, Los Angeles, Calif.

## Temple N. Joyce

JOYCE, TEMPLE N., Commercial Aviator; born, Baltimore, Md., June 27, 1895; son of Harry Brewer Joyce and Orris (Howard) Joyce.

*Educated:* Baltimore Polytechnic Institute; Lehigh University.

*Professional:* Sales Engineer, Truscon Steel Co., 1915-1917; U. S. Representative, Societe Morane Saulnier, 1919-1921.

*Aeronautical Activities:* Commissioned 1st Lieut., Nov. 1917; training overseas, 1919; test pilot; ass't Chief Test Department, 1918-1919; holder of world's loop record, Jan. 16, 1919 (300 in 66 mi.); Maryland State Aviation Commission, Nov. 1920.

*Flying Rating:* Reserve Military Aviator.

*War Honors:* Citation by Gen. Pershing, April 19, 1919 at Issoudun, France.

*Member:* Aero Club of Amercia; American Flying Club of Baltimore.

*Present Occupation:* Representing Morane Saulnier.

*Address:* 709 Equitable Bldg.; home, 415 East 25th Street, Baltimore, Md.

## Robert E. M. Goolrick

GOOLRICK, ROBERT E. M., Major, Air Service; born, Fredericksburg, Va., June 9, 1886; son of Judge John T. Goolrick and Mrs. John T. Goolrick.

*Educated:* Six years in public schools; four years in private schools; two years, Fredericksburg College; four years, Virginia Polytechnic Institute, B.S. in Electrical Engineering, 1907.

*Aeronautical Activities:* Detailed in Air Service, 1920; March 1921, Air Service Pilots School, Carlstrom Field, Fla.

*War Service:* Command 1st Anti-Aircraft Battalion, A. E. F., Nov. 1917 to Nov. 12, 1918.

*War Honors:* Croix de Guerre.

*Present Occupation:* Major, Air Service.

*Address:* Fredericksburg, Va.

## Harold E. Talbott, Jr.

TALBOTT, HAROLD E., Jr., Airplane Constructor; born, Dayton, Ohio, March 31, 1888; son of Harry E. Talbott and Katherine H. Talbott.

*Educated:* Sheffield Scientific School, Yale University.

*Professional:* President, Dayton Wright Co.; President, Dayton Securities Co.; Vice President, DeWeese-Talbott Co.

*War Service:* Major, Air Service.

*Member:* Aero Club of America.

*Present Occupation:* President, Dayton Wright Co.

*Address:* 1st and Ludlow Streets; home, Runnymede, Dayton, Ohio.

## Ernest Jones

JONES, ERNEST, Aviation Information Expert; born, Haverstraw, N. Y., Aug. 14, 1883; son of Lavin P. Jones and Cordelia (Kile) Jones; married, Austine Vae, April 29, 1902.

*Educated:* Haverstraw High School; Eastman Business College.

*Professional:* Proprietor of hardware business; Connected with the aero and automobile shows of 1906 and 1907; assistant secretary, Aero Club of America, 1906-1907; established pioneer aeronautical journal "Aeronautics" in 1907 and conducted it until 1915; Sec. Aeronautical Congress of Jamestown Exposition, 1907, and collected the aeronautical exhibits for that exposition; founder of the Aeronautical Society; founder and was first president of the Aeronautical Manufacturers Association during aero show in 1912; advertising and publicity manager for the Wright Co. and Wright-Martin Aircraft Corp. in 1916-1917; appeared on various occasions as expert in aeronautical litigation.

*War Service:* Volunteered for Air Service, 1917; commissioned 1st Lt., June 1917; organized information office which developed into present information Group of the Office Chief of Air Service; commissioned Capt., Oct. 24; overseas, Oct. 24, 1917; organized air information office which became finally Information Section, Air Service, A. E. F., May 11, 1918; in Argonne Offensive, Sept. 1918; Feb. 20, 1919, relieved as Chief Information Section, Air Service, A. E. F. for temporary duty in London; promoted to Major, Feb. 20. 1919; Chief Dissemination Division, Information Group, Office Chief of Air Service, Washington from May 1, 1919 to June 30, 1921; discharged from service, Nov. 30, 1920; on civilian status as aeronautical information expert to June 30, 1921.

*War Honors:* Medaille d'Honneur des Affairs Etrangeres en Argent, French Government.

*Present Occupation:* Aeronautical Information Expert, Office Chief Air Service.

*Address:* Office Chief Air Service, Washington, D. C.

## Victor Daniel Herbster

HERBSTER, VICTOR DANIEL, Lt. Comdr. U. S. Navy; born, West Newton, Pa., July 20, 1885; son of S. K. Herbster and Carolyn Herbster; married, Vaudine Nolan, June 3, 1919.

*Educated:* Public and high schools of Irwin, Pa.; 1908, U. S. Military Academy.

*Aeronautical Activities:* Ordered to aeronautical duty, Oct. 1911, Annapolis, Md., San Diego, Dayton, Pensacola, Marblehead, Washington, Germany, England, France, Ireland, Panama, Canal Zone; learned to fly on Model B, Wright, experimented with pontoons on this machine 1911-12; experimental aviation work on Burgess, Curtiss, Naval aircraft for several years; Constructed and operated air stations during war; station pilots bombed four submarines. Commanding Officer, U. S. Naval Air Stations in Ireland; took command Coco Solo, Dec. 2, 1819.

*Flying Rating:* Naval Aviator No. 4

*War Service:* Armed Guard Transport; Commanding Officer, Naval Air Station, Wexford, Ireland.

*Member:* Army and Navy Club (Wash.).

*Present Occupation:* Commanding Officer, U. S. Naval Air Station, Coco Solo, Canal Zone.

*Address:* c/o Navy Department, Coco Solo, Canal Zone.

## Frederick William Barker

BARKER, FREDERICK WILLIAM, Patent Attorney; born, London, England, Dec. 18, 1864; son of Walter Barker and Amelia Elizabeth (Bouney) Barker; married, Constance Beatrice Reynolds, Oct. 31, 1888.

*Educated:* Whitgift School, Croydon, England.

*Professional:* Patent Attorney from 1885 to date. Practiced in England, Washington, D. C., and New York; closely allied with the automotive industry since its inception and was one of the attorneys for Henry Ford in the Selden Suit.

*Member:* Aeronautical Society of America (past President); Aero Club of America; Patent Office Society; Richmond County Country Club; British Schools and Universities Club; City Club; Great Kills Yacht Club.

*Present Occupation:* Patent Attorney.

*Address:* 2 Rector Street, New York, N. Y.; home, Great Kills, Staten Island, N. Y.

## Marvin Carrol Williams

WILLIAMS, MARVIN CARROLL, M.S., Air Service; born, Farmington, Mo., Jan. 31, 1887; son of Joseph Carroll Williams and Jennie (Price) Williams; married, Grace Frances Staley, May 4, 1918.

*Educated:* Private Schools; Farmington Baptist College; Carleton College; Laredo Military Academy, Laredo, Tex.

*Professional:* Enlisted in Signal Corps, June 1906; duty in Philippine Islands, 1907; 1908, Post Telegraph Operator, Rizal, P. I.; 1909, on mine planter as radio operator, San Francisco Bay; 1910, 1911, radio operator on U. S. Transport, Logan; 1911, 1912, Post Telegraph Operator, Presidio of San Francisco, Calif.; 1913, 1914, on duty at Fort Omaha, Nebr., Texas City, Tex., San Diego, Calif.; 1915, with Pershing Exhibition; 1917, on duty at Kelly Field, Fort San Houston, and Chanute Field.

*Aeronautical Activities:* 1918, Chief Clerk in Aviation General Supply Depot, Chicago, Ill.; 1919, in charge of Engineer Office, Scott Field; 1920, Chief Mechanic, 95th Pursuit Squadron Headquarters, Kelly Field, No. 2; 1920 to date, Chief Clerk, Middletown Air Intermediate Depot, Middletown, Pa.

*War Service:* Continuous service, U. S. Signal Corps and Air Service, since June 1906.

*Present Occupation:* Chief Clerk, Middletown, Air Intermediate Depot.

*Address:* Middletown, Pa.

## Earl Talmadge Vance

VANCE, EARL TALMADGE, Commercial Aviator; born, Washington, Ind., Jan. 13, 1896; son of Warren Perry Vance and Jennie (Jacobs) Vance.

*Educated:* High school; Graduate Accountant and Stenographer.

*Professional:* 1916-1917, office manager for Construction Company in Aberdeen, S. D.; manager of rice plantation in Louisiana one summer; commercial flying for year and half.

*Aeronautical Activities:* Transferred from 19th U. S. Inf. to Ground School, Austin, Tex., Dec. 8, 1917; completed 8 weeks Course, Feb. 2, 1918; ordered to Love Field, Dallas Tex.; commissioned 2nd Lieut., Reserve Military Aviator, with Pursuit Rating and made Flying Instructor, May 8, 1918; ordered to Payne Field, Miss., June 3, 1918 and instructed in flying until made Ass't, Officer in Charge of Flying; discharged, April 1919; later, commissioned 1st Lieut. Air Service Reserve.

*Flying Rating:* Reserve Military Aviator.

*War Service:* U. S. Infantry, May 25, 1917 to Dec. 8, 1917; transferred to Air Service.

*Member:* Texas Aero Club.

*Present Occupation:* Commercial flying; Manager Aero Miles City Club, Miles City, Mont.

*Address:* P. O. Box 994; home, Alpine Apartments, Miles City, Mont.

## Daniel Kiser

KISER, DANIEL, Mail Pilot; born, Chicago, Ill., Nov. 19, 1894; son of John D. Kiser and Ina M. Kiser.

*Educated:* St. James Grammar and High School.

*Professional:* Experimental airplane Construction, 1910-1916, monoplanes, biplanes, tandems, quadruplanes, and motors of all types.

*Aeronautical Activities:* 1916-1917, exhibition work; Curtiss type pusher, April 1917 to Dec. 1918; Jan. 1918-Jan. 1921, exhibition and passenger work in Central and Southern states; Jan. 1921 to date, pilot, U. S. Air Mail.

*Flying Rating:* F.A.I. Certificate No. 2346; F.A.I. Expert Certificate No. 193.

*War Service:* Civilian flying instructor; one of the first three night flying instructors in the United States.

*Present Occupation:* Pilot, U. S. Air Mail.

*Address:* Air Mail Station, May wood, Ill.; home, 5820 So. Park Ave., Chicago, Ill.

## William H. Garrison

GARRISON, WILLIAM H., Major, Air Service; born, Brooklyn, N. Y., Jan. 29, 1885; son of William H. Garrison, Sr. and Mary (Tucker) Garrison; married, Myrtle Jeannette Mackin, Aug. 17, 1917.

*Educated:* Brooklyn Preparatory Polytechnic and Erasmus Hall High School; U. S. Military Academy.

*Professional:* Army Officer.

*Aeronautical Activities:* Training and flying duty at the following fields: Brooks, Ellington, Gerstner, Souther, Park, Payne, Taylor, Door, Carlstrom, Bolling, Hazelhurst, Langley, Wilbur Wright, Eberts, Love, Post, Call, Carruthers, Kelly, Mather, and March.

*Flying Rating:* Junior Military Aviator; Airplane Pilot.

*War Service:* Oct. 1917 to Jan. 1919.

*Member:* Army and Navy Club, Manila, P. I.; Army and Navy Club (Wash.).

*Present Occupation:* Commanding Officer, San Antonio Air Intermediate Depot.

*Address:* Kelly Field, San Antonio, Tex.

## Charles Jasper Glidden

GLIDDEN, CHARLES JASPER, Financier; born, Lowell, Mass., Aug. 29, 1857; son of Nathaniel James Glidden and Laura Ellen (Clark) Glidden; married, Lucy Emma Featherstone, July 10, 1878.

*Educated:* Public Schools of Lowell, Mass.

*Professional:* Messenger for the Northern Telegraph Co., Lowell, Mass.; Conducted experiments with Prof. A. Graham Bell in telephone test, Manchester, N. H., to Boston, Mass., 57 miles; built first long distance telephone line in the world, Lowell to Boston, Mass., 1879; built private telephone lines in New England cities, 1877; obtained first telephone subscriber in the world to a telephone exchange; donor of the Glidden Trophy for Automobile Touring; took first car around the world twice; Secretary, Treasurer, and President of several New England and western Telephone Companies; retired from active business, 1899-1917.

*Aeronautical Activities:* Made 50 balloon ascensions (49 free ascensions, first in 1908), 3 in France, 4 in England, 42 in the United States, 1 in the observation balloon at Fort Omaha.

*Flying Rating:* International Balloon Pilot, 1908.

*War Service:* Commissioned First Lieut., Aviation Section, Signal Officers' Reserve Corps, June 12, 1917; July 5, 1917, Aeronautical Officer, Northeastern Department, Boston, Mass.; Sept. 22, 1917, President, Aviation Examining Board, Ft. Omaha; Feb. 20, 1918, commissioned Captain; Oct. 3, 1919, appointed Major, Aviation Section, Signal Officers' Reserve Corps; Oct. 10, 1919 to June 13, 1920, third tour of the world as Executive Secretary of the Commission which organized the First Aerial Derby Around The World.

*Member:* Royal Geographical Society; American Geographic Society; Touring Club of France; Algonquin Club (Boston); Massachusetts Consistory.

*Present Occupation:* Financier.

*Address:* Lorraine Hotel, New York, N. Y.

## Howard Franklin Wehrle

WEHRLE, HOWARD FRANKLIN, Building Constructor; born, Charleston, W. Va., Jan. 20. 1890; son of Henry Wehrle, Jr. and Alice Adams (Abbott) Wehrle; married, Anna Masten Estill, June 27, 1917.

*Educated:* Graded schools and Charleston High School.

*Professional:* Yellow Pine Lumber Co., 1907; Goshorn Hardware Co., 1910; Hagerstown Shoe Co., 1911-1912; Capitol City Supply Co., 1913-1915.

*Aeronautical Activities:* Entered Curtiss Aviation School, April 1916; mustered into Federal Service at Fort Monroe, July 13, 1916; assigned to duty at Mineola, N. Y., Aviation Section Signal Corps; duty at Kelly Field Nos. 1 and 2, Sept. 1917 to Oct. 1917; duty at Taliaferro Field to Sept. 1918; ordered overseas with Handley-Page Training Station No. 1; returned from England, Nov. 1919; duty at Hazelhurst Field to Feb. 1919; duty at Carlstrom Field, to May 1919; duty at St. Paul, Minn. till leaving the service; at present, Chairman, Aerial Service Committee, Chamber of Commerce, Kansas City.

*Flying Rating:* Pilot's certificate No. 658 in Federation Internationale Aeronautique; Reserve Military Aviator, March 1917.

*War Service:* Aviation Section Signal Corps, July 1916 to Aug. 1919.

*Member:* Aero Club of America; Lakewood Golf and Country Club; Flying Club of Kansas City; American Legion.

*Present Occupation:* District Manager, Kansas City Office, Kinnear Mfg. Co. of Columbus, Ohio.

*Address:* 503 Railway Exchange Bldg.; home, 5101 Baltimore Ave., Kansas City, Mo.

## Warren Bradley Bovard

BOVARD, WARREN BRADLEY, Educator; born, Los Angeles, Calif., July 4, 1885; son of George Finley Bovard and Emma J. (Bradley) Bovard.

*Educated:* Los Angeles City Schools; 1900-1904, University of Southern California.

*Professional:* Elected Assistant Treasurer, University of Southern California, 1905; took leave of absence during period of war; elected Business Manager in Jan. 1919; took leave of absence to serve as Executive Secretary to Governor William D. Stephens, (State of California) May 1919; returned to the University, July 1920; elected Comptroller of the University, Dec. 1920 and serving in that capacity at present.

*Aeronautical Activities:* Kelly Field, Sept. 1917 to Dec. 1917, served on staff of Commanding Officer.

*War Service:* Office of Chief Signal Officer, member of General Staff from Dec. 1917 to Jan. 1919.

*Member:* University Club, Los Angeles; Los Angeles Athletic Club; American Legion.

*Present Occupation:* Comptroller, University of Southern California.

*Address:* University of Southern California; home, 801 West 34th Street, Los Angeles, Calif.

## Esten B. Koger

KOGER, ESTEN B., Commercial Aviator; born, Decatur City, Iowa, May 21, 1881; son of George Bluford Koger and Ettie (Smith) Koger.

*Educated:* Hickory Grove School; Decatur City High School; University of California, 1917; Massachusetts Institute of Technology 1918, special course.

*Professional:* Ranching, Oklahoma and Texas, 1895-1900; with Houston and Texas Central Railway Co., 1901-1903; E. R. Thomas Motor Car Co., 1904-1906; Elmore Motor Car Co., 1906-1907; E. R. Thomas Motor Car Co., special representative to Japan, China, and Philippines, 1908-1909; Sales Department, Oakland Motor Car Co., 1910-1912; sales engineer, Master Carburetor Corp., for Canada and Cuba, 1913-1916.

*Aeronautical Activities:* Border duty, El Paso, Tex., with 7th Division, Pennsylvania National Guard, 1916; entered Aviation Section, Signal Corps, Nov. 1916; trained at Curtiss Aviation School, 1917; aeronautical course at University of California; Bureau of Military Aeronautics, Washington, D. C.; transferred to U. S. Navy, Bureau Engineering, Division of Aeronautics, Experimental Department, Oct. 1917; member of Naval Trial Board, for aircraft acceptance; on duty at various Fields and on June 9, 1918 while on duty at Hampton Roads, Va., sighted and dropped a bomb on German submarine.

*Flying Rating:* F.A.I. No. 244, July 1917; Naval Aviator Certificate No. 649, June 1918.

*War Service:* As above.

*Member:* Society of Automotive Engineers; University Club, Washington, D. C.

*Present Occupation:* Purchasing Agent and Inspector, Davis-Douglas Co.

*Address:* 515 S. Alexandria Ave., Los Angeles, Calif.

## Will Carpenter Lambert

LAMBERT, WILL CARPENTER, Commercial Aviator; born, Ironton, Ohio, Aug. 18, 1894; son of Will Gordon Lambert and Mary (Pierce) Lambert; married, Chloe Hall, Dec. 29, 1920.

*Educated:* Ironton High School.

*Professional:* Chemist and factory supervisor at the Nobel plant of the Canadian Explosives Ltd., Montreal, Quebec, 1914-1916.

*Aeronautical Activities:* Enlisted, R.F.C. in Toronto shortly before the U. S. declared war; served as instructor and gazetted 2nd Lieut., Oct. 13, 1917; joined 24th Sqd., R.F.C., B.E.F., March 1918 and served with this unit 6 months; officially credited with destruction of 17 enemy machines and 7 unofficial victories; discharged, Sept. 1919; manager, Lambert Commercial Flyers, photography and advertising through the South, 1919; organized R.A.F.U.S.A. Flyers, 1920, for Commercial work.

*War Honors:* Distinguished Flying Cross, July 4, 1918; Gazetted D.F.C., Aug. 3, 1918; Investiture, Prince of Wales, Nov. 1919 in Washington, D. C.

*Member:* Aero Club of Dayton and Cincinnati, Ohio; American Legion, Clarence Field Post, Ashland, Ky.

*Address:* 1448 Park Road, Washington, D. C.; home, 318 Hepler St., Ironton, Ohio.

## George Hudson Watkins

WATKINS, GEORGE HUDSON, born, Auburndale, Fla., April 7, 1886; son of Thomas B. Watkins and Rachel Watkins.

*Educated:* Public schools; Rindge Technical School, Cambridge, Mass.

*Professional:* Auto repairing, driving, and testing since 1906.

*Aeronautical Activities:* 1912, tested pontoons in New Orleans; U. S. Air Service; exhibition flying and passenger carrying since service in the army.

*Flying Rating:* Reserve Military Aviator.

*War Service:* M.I.T. Ground School, Dec. 1917; transferred to Aviation Section and sent to Camp Dick; trained at Taliaferro Field and Ellington Field.

*Present Occupation:* Auto demonstration and flying.

*Address:* 700 Commonwealth Ave., Boston, Mass.; home, 7 Story St., Cambridge, Mass.

## James Valentine, Jr.

VALENTINE, JAMES, JR., Student; born, Milwaukee, Wis., Jan. 24, 1896; son of James Valentine and Jessie (Mill) Valentine.

*Educated:* Glen Ridge High School; Toronto University School of Military Aeronautics; Stevens Institute of Technology.

*Aeronautical Activities:* Same as war service.

*Flying Rating:* Pilot, Royal Flying Corps.

*War Service:* Enlisted R.F.C., July 1917; commissioned, Nov. 1917; Active Service, 104th Squadron, Independent Force, R.A.F., May 1918-Dec. 1918.

*Member:* Student Membership, Royal Aeronautical Society.

*Present Occupation:* Student, Stevens Institute of Technology.

*Address:* 364 Maolis Ave., Glen Rdige, N. J.

# Aviation in Russia

Some interesting information on Russian aerial activities during and after the Great War was recently supplied to our German contemporary *Der Luftweg* by Andreas Frank, earstwhile lieutenant in the Russian navy.

Russian aviation did not begin to develop to any great extent till 1916. During the first two years of the war the Russian aero squadrons were mostly equipped with foreign airplanes, but by 1916 the Russian aircraft industry had come into being, and at the end of the war most of the Russian airplanes were of national manufacture.

The most important airplane factories were: In Petrograd Lebediew, which produced biplanes fitted with Salmson engines, and the Russo-Baltic Works, which mainly built giant airplanes to the designs of Igor Sikorsky; in Moscow the Dux Works, which were building Nieuports and Spads. The latter firm had a branch established in Odessa, where Anatra seaplanes and Anasal engines, the latter of the Salmson type, were turned out under the supervision of the French engineer Decans. The principal seaplane contractor, however, was Shetenin, who produced flying boats to the plans of naval engineer Grigorovitch. The engines for these machines were mostly imported from abroad, although a number of Gnome rotaries was supplied by the Moscow branch of that French firm.

As to complete aircraft, France supplied mainly Spads, England Sopwiths, and the United States Curtiss flying boats.

Army headquarters laid much stress on that pilots not only be given practical training but also a thorough theoretical foundation, to which end courses were arranged at various colleges in Petrograd and Moscow. In Kieff a six months' course was held for observers, and N.C.O. and private photographers were trained at the same place. A meteorological course was held at Pawlowsk by the well-known Professor Kuznetsoff for officers and N.C.O.'s. The importance of meteorological knowledge was considered particularly important in view of the great variety of climates that exist in Russia.

In addition to the general flying school for the training of cadets, special schools were created where pre-war pilots were given instruction in military aviation. Each sector of the front had a flight inspector who was in charge of aviation of the respective army group, and a chief inspector was attached to General Headquarters. The direction of the flying schools supplies, etc., was in Petrograd. The army vigorously supported the native aircraft industry; it was assisted in this endeavor by a committee which gathered funds for the development of a Russian air force and which maintained a flying school of its own.

### *The Revolution*

The revolution broke out just when the Russian air service was in a state of great expansion which gave those interested in Russian aeronautics great hopes for peace time developments. The revolution checked popular interest in aviation and soon aircraft production fell off, while at the front the morale of the air service suffered a similar slump, for all would be pilots and none mechanics. As a result work practically ceased at aircraft depots and parks, and supplies sent to the front were stolen en route. During the Bolshevist revolution the Dux factory alone showed any activity at all, engaging in the conversion of military machines into commercial aircraft.

During the civil war aviation developed chiefly at the northern army, at Arkhangel, where Captain Kozakhoff, the best known Russian flier, was in command of the air force. After the failure of this army, the volunteer army of General Baron Wrangel possessed the strongest air service. This consisted at the start of two airplanes which the Bolshevists had left behind at Rostov during their retreat, but it gradually expanded, until at the best period of this army it consisted of six aero squadrons. There were four volunteer squadrons and two Don squadrons, each consisting of three flights of six machines each. The South-Russian flying corps also incorporated in its fleet a number of airplanes it had captured during its advance on Moscow.

From the very beginning of operations it turned out that the requirements of civil war differed considerably from those of the World War, and pilots and observers experienced much difficulty in adapting themselves to the changed conditions. Service flights were seldom carried out at altitudes greater than 3000 ft., the average altitude being between 1500 and 2000 ft.

As the war was principally waged along the railroad lines, the chief duty of the fliers was to keep headquarters correctly informed on conditions at the railroad junctions. In this connection pilots rendered their best service and enabled the fronts to be held with comparatively small forces. Aerial photography was not engaged in; instead great importance was placed on the cooperation of airplanes in machine gunning the enemy positions.

As the bad roads in the interior of Russia made it impossible to move the flight squadrons by motor transport, they were installed in trains.

### *Bombing*

Bombing was a difficult duty in the civil war, as there was no distinct front with trench lines to tell friend from enemy. A further inconvenience, commented upon by Lieutenant Frank, was that "in civil war prisoners do not exist and therefore one knows on crossing the lines that if the engine lets you down one will be shot and possibly tortured too."

The pilots of the volunteer army also did much dropping of propaganda leaflets behind the enemy lines and this resulted more than once in thousands of Red guardsmen surrendering.

The Allies supplied the South Russian air service with a number of machines which, though quite modern, were unfortunately ill suited for the purpose. Thus one shipment comprised Sopwith pursuit machines, but these proved of little use to the volunteers as there were no opponents to fight with. Their chief need was bombing airplanes, and of all the flying equipment supplied by the Allies only two squadrons of DeHavilands proved really useful.

Although in the Great War the G.H.Q. had little faith in flight reports, the experience of the civil war largely increased the respect of the commanding officers for the air service. The first squadron that participated in the combats in the Donetz region under the command of Colonel Konovaloff rendered particularly good service. As the railroad from Petrovsk to Grossni was continually threatened by revolutionaries, an air mail service was created for military communications.

### *The Bolshevist Air Service*

The main force of the volunteer flying corps was kept in the Crimea and was commanded by General Tkatchoff, who had been chief of the imperial air service during the Great War. The Anatras seaplane works, which had been transferred to Simferopol, were used for repairs and maintenance.

The author personally remembers but two instances where Bolshevist airplanes crossed the lines of the Wrangel army, although the Soviet authorities are said to spend great sums on aviation and to hold much equipment from pre-revolutionary days. Leon Trotsky, Soviet war minister, is deeply interested in the expansion of the Bolshevist air service, but this notwithstanding little progress is being made in putting it in an efficient condition. The chief of the Soviet air service is a young pilot named Sergieff whose principal qualifications seem to be his being a keen Bolshevist. Most of the leading positions of the central air force committee are held by young men who have had no previous experience in aviation, being apparently selected for their political leanings. Only a few of the former imperial Russian air officers are serving with the Soviet air force. As their families are held as hostages for their faithfulness to the Red regime, it may be imagined that there is not much cooperation or confidence between headquarters and the squadrons.

Numerous Bolshevist pilots surrendered to the Whites despite the fact that they had Communists for observers, and many valuable military secrets were thus revealed to the volunteer army. Realizing their inability to stop this state of affairs, Red headquarters eventually withdrew their squadrons from the front and started to train Lithuanians and Chinese. The results were, however, poor, for the new pupils crashed so many machines that the only producing aircraft factory, Dux, could not keep pace with the spare parts and new machines required. So finally the Bolshevist limited their aerial activities to the use of airplanes for propoganda purposes, chiefly during the visits of foreign guests. As little gasoline is available for flying, much of it being stolen in transit, the Bolshevist airplanes use a synthetic fuel called Kazansky; but this is said to be usable only in the summer.

Naval aviation developed much more quickly in Russia than military aviation, because the Admirality disposed of larger funds for this purpose than the war department. At the beginning of the war the Russian navy had in service a few Curtiss and F.B.A. flying boats, and some Farman float seaplanes, none of which satisfied the requirements of the pilots. For this reason the admiralty called upon Russian designers to turn out improved designs. Shetenin gradually became the chief contractor of the Russian navy and his aircraft, which were built to the designs of the naval engineer Grigorovitch, formed the main equipment during the war. The principal models used were the M.5, a two-seater fitted with the Monosoupape Gnome; the Salmson-engined three-seater M.9; and the M.15 two-seater, fitted with the Hispano-Suiza 150 hp. engine. The fighting qualities of these craft were poor, but in return the machines were very stable and carried a large useful load.

The naval air service was organized on different lines in the Baltic and in the Black Sea. In the Baltic the navy department created air stations mainly on islands and along the coast, while in the Black Sea more attention was paid to the carrying of naval aircraft on motherships. Beside the seaplane formations used at the various naval air stations the admiralty also created land pursuit squadrons to protect the bases against bombing attacks. In the Black Sea there was also created a naval airship station, but two airships purchased from Great Britain proved of little value and so the station was soon given up. Shortly before the outbreak of the revolution Shetenin produced the pursuit flying boat M.23, which was fitted with a Hispano-Suiza engine. This machine proved a success, but it could not be put in production because of the revolution.

During the civil war the Wrangel army had a small naval air service under Captain of Frigate Litvinoff, who during the Great War commanded the Baltic naval aviation. It comprised mostly old Russian seaplanes, and also a number of Albatros machines which the Germans had left behind at Sebastopol during their retreat from the Ukraine. In the Crimea British naval pilots, operating seaplane carriers, assisted the South Russian cause. The Russian volunteer army also possessed two naval flight detachments on the Caspian Sea, where they were active against the Astrakhan red forces.

On the Bolshevist side the naval aviation also seems to be more enterprising than the army aviation. This applies especially to the pilots of the Astrakhan fleet. The Red formations operating on the Black Sea had a sufficiency of aircraft and fuel and were active, too, but, says the writer. "the pilots only had a red polish, being white by inclination, for which reason they avoided encounters with the White aircraft."

The Russian seaplane industry has now ceased to exist. The main stores, at Petrograd, were destroyed by an explosion, while much material was lost during the Bolshevist retreat from Petrograd to Yaroslav.

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# Airplane Estimate of Hurricane Damage

Another example of the application of aircraft to peace time pursuits, with a consequent saving of time and expense, is afforded by the reconnaissance of the recent hurricane damage to timber on the Olympia Peninsula. Three airplanes in three days at an estimated cost of $2,524, did what would probably have cost in the neighborhood of $125,000 by ground survey.

The work, jointly undertaken by the Army Air Service and the Forest Service, was done in three DH-4B machines from Mather Field. The first day, two machines carried members of the Air Service detachment and a Forest Service Sketcher over the damaged area. The second day two machines carrying a photographer and the sketcher beside the pilots made a reconnaissance. The work was concluded on the third day when the three machines, with the detachment and sketcher, flew over the area. The report of the work includes a number of mosaics, a map made from them, and several obliques.

A study of the map shows the storm to have been gusty in character, blowing down timber in some areas and leaving it untouched in others. From the mosaics the number of trees blown down can be estimated. The devastated area covers 1000 square miles of valuable timber land in country practically devoid of roads.

TWO AERIAL VIEWS OF THE TIMBER BLOWN DOWN BY A HURRICANE ON OLYMPIA PENINSULA

# Underwriters Issue Pilot and Aircraft Registers

An important move towards putting commercial and private aviation in the United States upon a definite footing is forecast with the announcement by Underwriters' Laboratories, Inc. that beginning July 1, 1921, it has put in operation an Aircraft Register and a Register of Aircraft Pilots. Both registers have been prepared at the request of the National Aircraft Underwriters Association, the members of which are hereafter to require the registration of aircraft which they insure against fire, theft, collision, stranding and sinking, or other hazards. Similarly, members of the N. A. U. A. are to recognize the Register for Aircraft Pilots as a condition of all policies issued hereafter.

Both the Aircraft Register and the Register of Aircraft Pilots are based upon the provisions of the Convention for the Regulation of Air Navigation agreed upon, subject to certain reservations, by the representatives of the Allied and Associated Powers serving on the International Commission on Air Navigation which was instituted as a sub-cimmission of the Peace Conference. The United States, although a signatory of the International Convention, has not yet ratified the same, but virtually every other civilized country with the exception of the late enemy powers has recognized it as the fundamental body of aerial law.

### *The Aircraft Register*

The Aircraft Register instituted by the Underwriters' Laboratories, Inc. defines aircraft according to ownership or use as State, Commercial or Private. State aircraft include (a) military aircraft, and (b) aircraft exclusively employed in State service such as posts, customs and police. Commercial aircraft include aircraft used for the purpose of any profession, trade or business when one or more persons (in addition to the pilot and necessary other members of the crew) or freight are carried for hire or reward. Private aircraft include all aircraft, not State or Commercial.

State aircraft being government owned and/or operated will not be subject to registration.

The application for registration filed by the aircraft owner requires all essential information regarding the ship which information as abstracted in the Register will have an important bearing upon many phases of insurance.

Aircraft intended for flying in international service will show the capital letter "N" preceeding the registration mark as a symbol of American ownership. Aircraft not flying abroad need show the registration mark only. This mark will consist of alphabetical symbols shown in capital letter, thus "ABCD" or "BMUL", etc. These registration marks preceeded by a dash will follow the nationality mark "N" for ships flying across national boundaries. A bar underlining the registration mark will identify aircraft registered for private use.

The registration and nationality marks will appear once on each side of the fuselage or nacelle and also once on the upper and lower wing surfaces of airplanes. The letters will be of a size sufficient to permit identification while in flight and at considerable distances and/or elevations from the observer. The registration mark will serve as the "call sign" of the aircraft in all radio or other signalling.

### *Register of Aircraft Pilots*

The plan for the registration of aircraft pilots includes various essential features as follows. (1) an application form to be filled out by the pilot seeking registration giving full data as to his training and subsequent flying experience (2) a physicians statement of surgical and medical examination (3) a certificate of registration to applicants found qualified (4) a system of bulletins to Association members announcing filing of applications, action thereon and cencellations of registry (5) a Board of Inquiry to consider crashes and (6) Rules of the Air, covering pilots' conduct and responsibilities.

The certificate of registration expires after twelve months and previously if the pilot is inactive in flying for ninety days. It may be cancelled or suspended at any time for cause and is automatically suspended pending Inquiry following a crash involving insurance.

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# Japan's Naval Air Service

It is not surprising that Japan has decided to strengthen her naval air service. That is her own affair. But it is not pleasant to read, in a dispatch from Tientsin, that a naval base is to be established on the southern coast of Formosa, 200 miles from Luzon and 500 miles from Manila. If Japan desired to have a point of vantage looking across the Formosa Strait to China, she would place it on the west coast of the island and oposite Amoy, distant 125 miles. A flying "take-off" at the southern end of Formosa would be nearly 900 miles from Nagasaki. Rear Admiral Bradley A. Fiske, retired, has been urging the Government for some time to create a strong air force in Luzon for the defense of the Philippines. The report that comes from Tientsin of the naval air program of Japan should at least put the United States upon its guard.

It is said that Japan's three air squadrons of six seaplanes, her present naval force, are to be expanded to fifteen squadrons of six machines each. The World War brought Japan's aviation plans to a standstill. In 1912 the Naval Flying Corps was organized with headquarters near Yokosuka. Just after the war a French air mission arrived to reorganize the military air service. In 1920 purchases of British and American planes were made and a number of Liberty engines acquired. Recently there came to Japan about one hundred British instructors, pilots and mechanics, most of whom had served in the army or navy, but were no longer connected with either. The engagement is profitable to them, if it is true that they receive $750 a month and allowances for their services. Japan already has several airdromes. Machines and parts have been manufactured for several years at the Kure and Yokosuka dockyards, and an aeronautical laboratory was opened at Tsukiji in 1918. Japan has begun to specialize in torpedoplanes. She has no swift aircraft carrier, but has planned some ships of this type. A year ago an airdrome was projected for Formosa. There are a few "blimps", or non-rigid airships, in use, but large airships are of the future.

Japan's Naval Flying Corps six months ago could boast of 270 officer pilots. This may not look like a formidable force, but it is to be expanded. In maneuvers held in 1919 the naval aviators made a very creditable showing. There has been an impression that the Japanese were not good material for pilots, but the truth is that they are enthusiastic about aviation and are apt pupils. The French air mission so reported. Interest in flying is not confined to the army and navy. Civilians have taken it up, and their societies have a membership of at least 15,000. Private firms are manufacturing planes and engines, and in addition to the military airdromes there are ten or more fields in the country. The Japanese are bent upon making a record in the air. It would be fatuous to dismiss their ambitions as a passing whim. Some observers speak highly of Japanese skill in aviation.

It would be a blow to our national pride if after seeing the French and British surpass us in the use of the airplane we were distanced by the Japanese, but that is what may happen if Congress habitually reduces appropriations asked for by the War and Navy Departments. In the Philippines both services should have a strong air branch, always available and ready for emergency duty. The cost would be considerable, but it would have to be regarded as an insurance made necessary by inexorable conditions. There is an alternative. The Powers could agree at the conference table to limit armaments. —*New York Times.*

## A Letter

EDITOR, AVIATION AND AIRCRAFT JOURNAL: Accounts in the public press from time to time are very injurious to the progress of the development of aeronautics. Minor accidents to aircraft are displayed in large head lines and spectacular performances of narrow escapes are produced from the imagination of the reporter.

A case in point is the capsizing recently of a seaplane owned by Burrell Johnson of this city, and you will doubtless see accounts of this appearing in the dailies of the Pacific Northwest. Accounts unite in stating that this seaplane nose dived into Lake Union from the air. The actual facts are as follows:

This seaplane was built in Portland in 1917 by men who had had very little experience in aircraft construction, and practically none in the design of airplanes. It was flown last year as a land machine and just recently set up on a two float landing gear by men who have practically no conception of the conditions necessary for stability of an airplane on the water. In rigging this machine the landing gear was drawn so far back that the center of buoyancy was some distance from the center of gravity of the machine. The stabilizer had been elevated about five degrees above the ordinary flying position; and the result of this was that when the machine was launched, it sat in the water with the nose of the floats well down and when the engine was started and speeded up to 1100 r.p.m. the propeller blast was sufficient to lift the tail and the machine merely turned over on its nose.

This is a very minor matter to areonautical men, and is no more serious than would be the case if a jack were to slip out from under an automobile with one wheel removed; yet the public press makes it appear that this is one of the dangers of flying, thereby injuring the game and retarding development by such misleading statements.

The writer would be pleased to assist in any campaign looking toward the correction of this evil of the daily papers.

J. W. MILLER AIRCRAFT CORP.
Seattle, Wash.

## New Farman Goliath Wins French Civil Competition

The competition for civil airplanes which was recently held in France under the auspices of the technical section of the French air department has been won by the new Farman Goliath transport airplane.

The requirements of this competition were as follows. The airplane was to be fitted with at least three engines, be capable of a ceiling of 14,500 ft., and have a horizontal speed of not less than 93 m.p.h. at 6500 ft., and 68 m.p.h. at 10,000 ft. In addition the machine was to make a series of flights at 500 ft. altitude carrying a useful load of 4400 lb., with the two wing engines throttled down to the extreme limit. The duration of these "throttled-down" flights was to be at least 20 min. each, with not more than a 5-min. flight at full throttle between each test. All these trials were to be made by the same pilot.

At the conclusion of these elementary tests the machine was to cover a distance of about 2700 miles in laps of 300 miles, during which test no replacement of parts was allowed with the exception of the engines.

The new Farman Goliath, which is merely an adaptation of the well-known cabin airplane which is extensively used on the Paris-London and Paris-Brussels services, obtained the following figures in the performance tests: ceiling, 14,650 ft. (14,500 ft. required); horizontal speed at 6500 ft., 99 m.p.h. (93 m.p.h. required); horizontal speed at 10,000 ft., 68 m.p.h. (as required); useful load, 4800 lb. (4400 lb. required). The endurance flight of 2700 miles was made in nine stages and in a total flying time of 34 hr., the engines being throttled down to 1300 r.p.m. and giving 208 hp. each. The three last stages were flown in rain, hail and snow, at an altitude of less than 650 ft. The pilot in the preliminary tests was M. D'Or, and in the endurance tests Lieutenant Gonin, who had previously flown from Paris to Constantinople in a twin-engined Goliath.

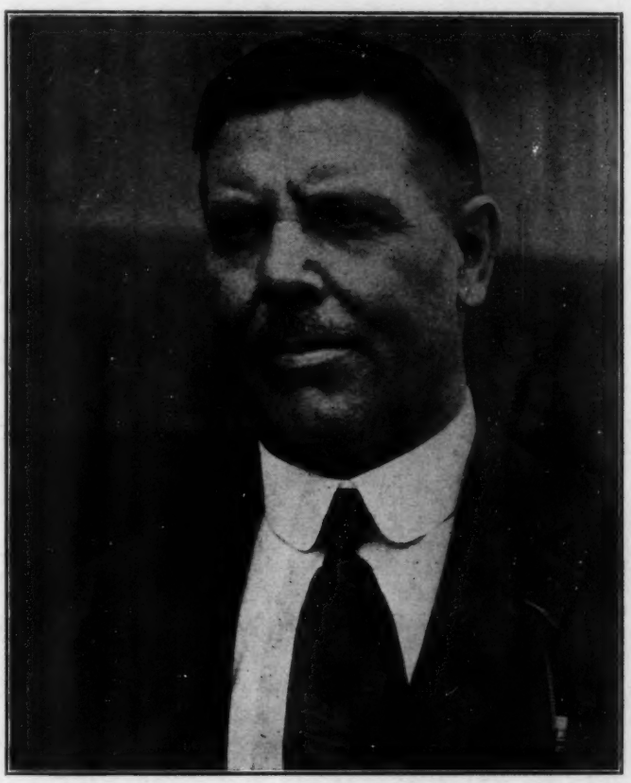
## Air Mail Plane Saves Life

Second Assistant Postmaster General Shaughnesy has just received a report of the use of an air mail plane to carry a physician and medical supplies across the bridgeless and flooded South Platte River at North Platte, Nebr., to save the life of a woman dying at a farm house two miles on the other side of the river.

The local physician, Dr. Selby, had phoned to all towns in a radius of twenty miles of North Platte, to determine if possible whether he could cross or ford the river at these points, but all bridges were washed out. The local air mail people took the responsibility of carrying the physician which has been approved at Washington. Pilot Smith took the doctor across without any mishaps or trouble of any kind and returned in 21 min.

The Superintendent's report says:

"At 3:20 p. m., June 13th, I received a radiogram from the Manager of the Air Mail Field, North Platte, stating that the bridge over the South Platte River, at that point, had been washed out at two o'clock that afternoon; that there was no method of crossing the river; that a woman was dying at a farm house two miles on the other side of the river and an immediate operation was necessary to save her life. In reply to this radiogram I stated that authority for such use should come from Washington, but that if it was a case of life and death, with positively no other means of crossing the river, I would grant the permission to use mail plane to cross the river with a physician, but would hold the pilot and manager strictly responsible for the safe return of the plane. The plane left the field at 4:07 and returned at 4:28, time elapsed, twenty-one minutes."



CARL F. EGGE, RECENTLY APPOINTED GENERAL SUPERINTENDENT OF THE AIR MAIL SERVICE
*Photo International*

## Aviation Officers Organize

Air service officers in Illinois, Michigan and Wisconsin are organizing into The Air Service Officers' Association of the Sixth Army Corps. P. G. Kemp, 1313 Chamber of Commerce Building, Chicago, is temporary chairman.

## Germany's Last Zeppelins Surrendered

Germany's last remaining Zeppelin airships have now been surrendered to the Allies under the terms of the Peace Treaty. The ships in question are the Nordstern and the Bodensee, both of which were built after the Armistice, which the Germans believed would exempt them from seizure. However, owing to the fact that seven war Zeppelins which the Germans had to surrender under the terms of the Armistice were destroyed in their sheds by "mutinuous crews", the Inter-Allied Commission of Aeronautical Control decided that Germany would have to make good the loss in new constructions of corresponding tonnage. This ruling explains the seizure of the Bodensee and the Nordstern, the first of which will be turned over to Italy, while the second has been assigned to France. The cover illustration of this issue shows the Nordstern arriving over the French airship station at Saint-Cyr.

The Nordstern is the 116th and last airship built to date by the Zeppelin works. She has a capacity of 800,000 cu. ft., and is 382 ft. long, 61 ft. 4 in. in diameter, and 80 ft. in overall height. The hull comprises thirteen gas compartments. The power plant is composed of four 260 hp. Maybach engines, two of which are mounted in separate wing cars approximately amidships, while the remaining two engines are fitted in a single car well aft. The main car, situated forward, contains the control station and the passenger compartment. The latter accomodates thirty-five passengers and 1100 lb. of baggage or mails, which represents the pay load. The crew consists of sixteen men. The ship has a maximum speed of about 85 m.p.h. and an endurance at three-quarter speed of 25 hr.

The Bodensee has now the same characteristics as the Nordstern, although originally she was 33 ft. shorter, and displaced 706,000 cu. ft. She was lengthened by the addition of one gas compartment early in 1920 in order to carry a greater number of passengers between Berlin and Friedrichshafen, on which route the ship operated with great success between August and December 1919. Altogether 100 trips were made by the ship in 98 days and the distance of 430 miles was covered on the average in 7 hr. Since then the Bodensee has remained idle in her shed and so has the Nordstern, which was completed in the meantime.

The French air department intends to use the Nordstern for the Marseilles-Algiers passenger air service, which is now in course of organization. The distance of this proposed trans-Mediterranean route is roughly 500 miles, with a possible emergency stop midway at the Balearic Islands.

When the Bodensee will have been delivered to Italy, Germany will have completed the surrender of all her Zeppelins surviving from the war period or built since, namely: Nordstern, L.72, L.Z.113 (to France); L.71, L.64 (to Great Britain); Bodensee, L.61, L.Z.120 (to Italy); L.37 (to Japan). Of these ships the ones assigned to France are maintained in operation as part of the training activities of the French airship service; the British ships will be scrapped if no bidder is found for them; the Italian L.Z.120, renamed Ausonia, was recently wrecked with its hangar during a gale, while the L.61 was scrapped; finally, the L.37, assigned to Japan, was delivered dismantled and nothing is known of its ultimate fate.

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## State Aeronautical Legislation

The personnel of the State Board of Aeronautics, created by the legislature of Oregon, is as follows: A. F. Roth, Portland, 5 years; W. E. Lees, La Grande, 4 years; L. B. Hickman, Portland, 3 years; L. G. DeVany, Rosebury, 2 years; and F. Hart, Medford, 1 year. Under the law creating the board, preference must be given in appointments to former Service pilots.

The board is required to meet for the purpose of conducting examinations on the second Tuesday of April, May, June, July, August and September of each year at such places as the board shall designate and at such other places and times as the board shall deem necessary. The law provides for the registration of pilots and aircraft, but exempts from this and all other provisions machines in the employ of the federal government or the state. This includes service machines, forest fire patrol machines and air mail machines.

## The Bombing Tests of the U. S. S. Iowa

The dummy bombing of the radio controlled exbattleship Iowa, which was scheduled for June 28, but was postponed on account of the thick haze, took place on June 29 off the Virginia Capes.

Unofficial reports state that twenty seaplanes and airplanes manned by Navy and Marine Corps aviators dropped eighty bombs in fifty-seven separate attacks, making two hits on the forecastle of the radio controlled target ship, the time taken for the completion of the exercise being three hours and nineteen minutes. The search for the ex-Iowa began at 8 a. m., when the planes left the stations established at Lewes, Del.; Cape Charles, Cape Henry and Cape Hatteras. The Iowa was under her own power, without pilot or crew, but directed by radio from the U. S. S. Ohio. She was steaming at half speed, but during the test the speed was varied by the operator on the Ohio between three and nine and a half knots an hour, which, with the many changes of course executed, made it exceedingly difficult for the bombers to aim accurately.

The bombing test proper was preceded by the search problem, in which the attacking aircraft had to determine the position of the Iowa in a possible area of 25,000 miles. This was achieved within two hours by the Army airship D-2, which spotted the Iowa and its consort of ships about 65 miles off Cape Henry and wirelessed the report to the U. S. S. Shawmut, flagship of the air forces. The message was intercepted by one of the F-5-L seaplanes well out at sea and relayed to the Shawmut. Shortly afterward the first bombers appeared over the target.

Nine F-5-L's, one NC boat, five Martin bombers and five De-Haviland land planes took part in the thirty-five aerial attacks. Several times the pilots had to hold their fire due to the changes in the course and speed of the Iowa. The F-5-L's attacked singly, flying in a continuous line over the moving target directly into the wind until their four 163 lb. bombs had been released. The only NC which reached the Iowa dropped her four 500 lb. bombs singly without making an actual hit. The DH-4s' land planes flown by Marine Corps fliers, of which there were five comprising a single formation, flew well and dropped two 230 lb. bombs each. The last attack of the day made by the five Martin bombers flown by Navy officers was the most spectacular, as these planes carried two 1,000 lb. bombs each. They flew in excellent formation and their final salvo made a beautiful pattern around the the Iowa, which brought praise from the many Army, Navy, Marine and foreign officers on board the U. S. S. Henderson and the other observation ships.

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## New Italian Parachutes

Two new types of parachutes have recently been perfected in Italy, one for individual use, and the other for collective use.

The Italian individual parachute, while it does not fundamentally differ from the general design of such equipment, incorporates some new ideas as to detail design. This applies in particular to the opening devise and the cover. In this parachute the shroud lines are led around the perephery through a large number of aluminum rings sewed onto the edge of the cloth. This makes the opening of the parachute rapid and positive, and it is said to be less liable to damage than the rubber tube used as a shroud lead on the French individual parachute, which is liable to tear. The folding of the Italian parachute is also easier and in operation the opening takes place with a minimum of jerk.

The collective, or nacelle parachute permits the salvage of the crew of a free balloon or kite balloon together with the basket instead of the occupant jumping singly overboard with parachutes. The nacelle parachute is fixed to the basket and is fitted with a release gear which detaches the basket from the gas bag. The release gear is controlled by the pilot. It appears from trials that a basket or car weighing less than 300 lb. equipped with such a parachute will descend at the rate of 12 ft. per minute.

The reception tests of this parachute, made under the control of the Italian Air authorities, have given complete satisfaction. The system may also be applied to cars of small airships.

# Airdrome Notes

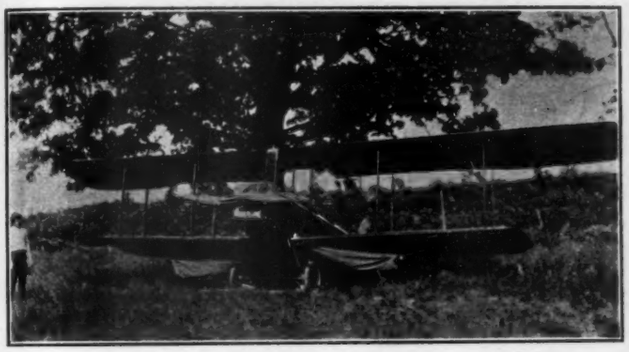
### Buffalo, N. Y.

The Buffalo Aircraft Corp. has been organized with the following officers: G. A. Moore, Pres.; A. H. Farrington, Vice Pres.; H. M. Echterling, Sec. and Treas.; and E. P. Morris, Business Manager.

The office of the firm is at 202 Main Street, Buffalo, and the airdrome, known as Morris Field, is the headquarters for the school which the corporation is conducting.

The airdrome extends 1950 ft. in length from W. to E. between South Park Ave. and McKinley Parkway. It is 950 ft. in width and marked with a circle enclosing a cross. The hangars and wind cone are in the N.W. corner of the airdrome and a welcome is extended to all pilots, no charge being made for other than supplies and service.

The school offers four courses—(1) Full course, mechanical, technical and flying; two months; (2) mechanical and technical, six weeks; (3) flying and care of airplane, one month; (4) time flying lessons by appointment. Students will have



Camping By Airplane

opportunities to work on machines landing at the airdrome, their services being given in return for the experience they gain. The airdrome will also be the headquarters of the Ericsson Aircraft, Ltd., of Toronto, and Capt. S. Moore will give exhiibtion flights from time to time as the occasion warrants.

### Oakland City, Ind.

The accompanying picture shows an ingenious method adopted by the Oneal-Walker Aerial Service for cutting down expenses. The oak tree is the hangar, and the men sleep in the hammocks slung under the wings.

### Philadelphia and Vicinity

The Aero Club of Pennsylvania reports the existence of the following landing fields in the vicinity of Philadelphia: (a) League Island Park Field, emergency, located at the foot of Broad street and just N. of the League Island Navy Yard. (b) Belmont Plateau Field, emergency, in Fairmount Park, on the W. side of the Schuylkill River. (c) Philadelphia Aero-Service Corporation Field, located about 17 miles N. of the Philadelphia City Hall and 1 mile N. of Hatboro. This is a splendid field, provided with hangers, where supplies are available. (d) United States Air Mail Field, located about 12½ miles N.E. of the Philadelphia City Hall and 1 mile N.E. of Bustelton.

### Lorain, Ohio

With a view to having this city placed on national air route maps, and to create interest in aviation, officials are planning a municipal airdrome in Lake View park. A temporary airdrome in the park is now in service for the accommodation of machines giving flights in connection with the convention of Spanish-American War Veterans this month.

### Hartford Aviation Meeting

Lieut. R. C. Moffat, representing the First Corps Area, Army Air Service, was the winner of the Hartford-Springfield air race conducted under auspices of the Hartford Municipal Aviation Commission in connection with the recent dedication of Brainard Field and the Municipal Airport at Hartford. Lieutenant Moffat's actual flying time for the 48-mile trip to Springfield and return was 25 min. 35 sec. The Charles K. Hamilton Memorial Trophy awarded him as winner of the event is the gift of Seymour Wemyss Smith, Hartford magazine writer.

John M. Miller in a Curtiss Oriole finished second in the

Brainard Field, The Municipal Airdrome at Hartford, Conn.

Springfield race. Athough actualy six minutes slower than Lieutenant Moffat, a handicap allowed resulted in the Oriole coming in but slightly more than a minute later. Charles Jones, also with an Oriole, was a close third.

Mr. Jones captured an aerial bombing contest, with Lieut. Stuart Chadwick, a former Army pilot who is now making the Hartford field his headquarters, a close second. Lieutenant Lott of Bridgeport, Conn., won an aerobatic test, and also led in a demonstration of landing from 3,000 ft. with motor dead. A seapane captured first honors in the Hartford-Middletown seaplane race, an HS flying boat actually making better time, but losing by its handicap.

### Chicago

Peterson Field is to be the headquarters of N. Black where he will demonstrate the Laird Swallow in the capacity of state agent for that firm. In addition to this Mr. Black will maintain machines for service between Chicago and neighboring cities. He also intends to pilot a Laird Swallow in the race for commercial machines under the auspices of the Aviation Country Club of Detroit in connection with the Pulitzer Trophy Race.

### Fort Wayne, Ind.

Organization of an Air Service Club was planned at a meeting of former army air service men. The Club plans to take over the equipment of the Pennel airdrome which is being closed by its present proprietor, John Pennel.

## New Aircraft Insurance Rules

The executive committee of the National Aircraft Underwriters Association has drafted coverages for this season's business. Several changes have been necessitated by reason of the heavy losses during the past year.

The executive committee felt that the rates must be kept down to as low a level as possible. When rates are already high (as aircraft rates necessarily are) it does not ordinarily help the experience to any appreciable extent, to make the rates still higher. Some other way must be found to correct the poor experience. Flying conditions will undoubtedly improve from year to year, and ways and means will also be found for reducing loss, cost and repair bills; but the best opportunity of all for reducing the loss ratio appears to be in the adoption of a modified form of coverage, whereby the assured becomes a co-insurer.

It has been decided, therefore, that the fire, transportation, theft, windstorms and collision coverages shall all embrace the 75 per cent loss payable feature, whereby the company pays three-quarters of each loss (or three-quarters of the excess portion of each loss for each coverage that bears a deductible feature).

The companies hope to bring about a considerable improvement in the experience by the use of this clause. There is no question but what an assured will be a little more thoughtful and perhaps a little more careful if he knows that he is not to be fully reimbursed for each loss that may occur. Furthermore, airplanes depreciate very rapidly. An amount of insurance which is less than the market value of the plane at the time of insurance may easily prove to be in excess of the market value of that plane before termination of the policy period. It is true that the policy is written on a "non-valued" basis; nevertheless the assured is not always thoroughly familiar with the method of settlement and he carries in his mind principally the amount of insurance for which the plane is insured. He is apt then to be impressed with the thought that a total loss under certain circumstances might even prove beneficial to him, or in any event, that his share of the loss would be practically nil.

The remedy, then, is not only to remove any possibility of a benefit accruing to the assured by reason of a loss, but also to make it worth while for the assured to exercise extreme care in the maintenance and operation of the plane. It was decided that the best means of accomplishing this was through the adoption of the 75 per cent loss payable clause. The companies writing aircraft insurance are anxious to help the aircraft business in every possible way. By placing a premium on carefulness, the companies are not only encouraging the prevention of accidents, but they are also striving to place aircraft insurance on its own feet. The aircraft insurance business cannot long continue unless there are prospects of reducing the loss ratio to a normal level.

The collision and windstorm coverages are written with a 5 per cent deductible amount, subject to a minimum of $250. The theft clause is written with $100 deductible clause.

In writing seaplanes, the windstorm and tornado coverage is combined with stranding and sinking coverage into what is called "mooring perils". The regular collision coverage for seaplanes is now called "flight collision". Collision rates are slightly reduced for land planes where a warranty is attached to the effect that the plane shall remain at all times within gliding distance of a specified landing field.

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## Bids on Naval Shipboard Planes

The Navy Department has received the following bids for the naval single-seater shipboard planes:

| Firm | Price |
|---|---|
| Martin Aeroplane Co. | $85,000 |
| L.W.F. Engineering Co. | 62,900 |
| Huff, Daland Co. (HD-2) | 76,000 |
| Huff, Daland Co. (HD-10) | 80,000 |
| Huff, Daland Co. (HD-11) | 76,000 |
| Lewis & Vought Corp. | 123,150 |
| Gallaudet Aircraft Corp. | 165,000 |
| Glenn L. Martin Co. | 93,611 |
| G. Elias & Bro., Inc. | 76,825 |

These prices apply for lots of three machines each.


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SAN FRANCISCO, CALIFORNIA
**EARL P. COOPER AIRPLANE & MOTOR CO.**

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**CHECKERBOARD AIRPLANE SERVICE**
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ALL TYPES OF CURTISS PLANES.

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*MASSACHUSETTS*
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**EASTERN AIRCRAFT CORP.**
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*MINNESOTA*
***WHITE BEAR LAKE, MINN.***
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KENILWORTH FIELD, BUFFALO, N. Y.
FYING STATION, ATLANTIC CITY, N. J.
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*OREGON*
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OREGON, WASHINGTON AND IDAHO AIRPLANE COMPANY
PORTLAND, OREGON

*PENNSYLVANIA*
Flying School and Commercial Aviation
Send for Circular
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| Type | Weight Full Load | Useful Load | Motors | Number of Motors and H.P. | Lbs. per H.P. | Lbs. per sq. ft. | Selling price without motor | Selling price with motor |
|---|---|---|---|---|---|---|---|---|
| HD-1B | 2850 | 5 seats 1100 lbs. | 10 cyl. Anzani | 2-100 200 | 14.1 | 6.5 | $4,500. | $5,700. |
| HD-4B | 1940 | 2 or 3 seats 740 lbs. | 10 cyl. Anzani | 1-100 100 | 19.4 | 5.8 | $4,200. | $4,800. |

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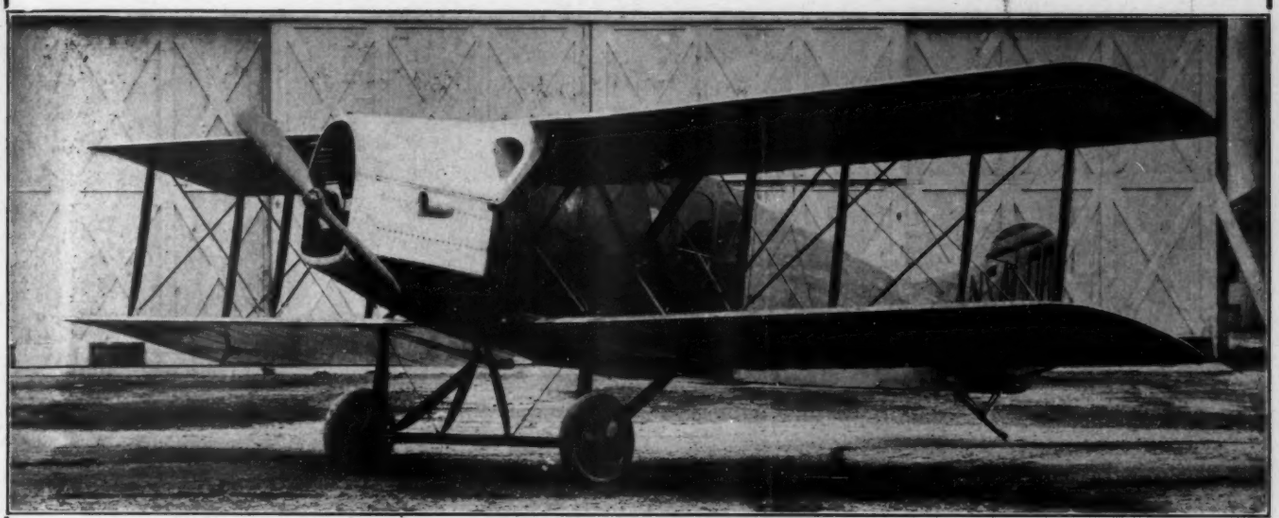

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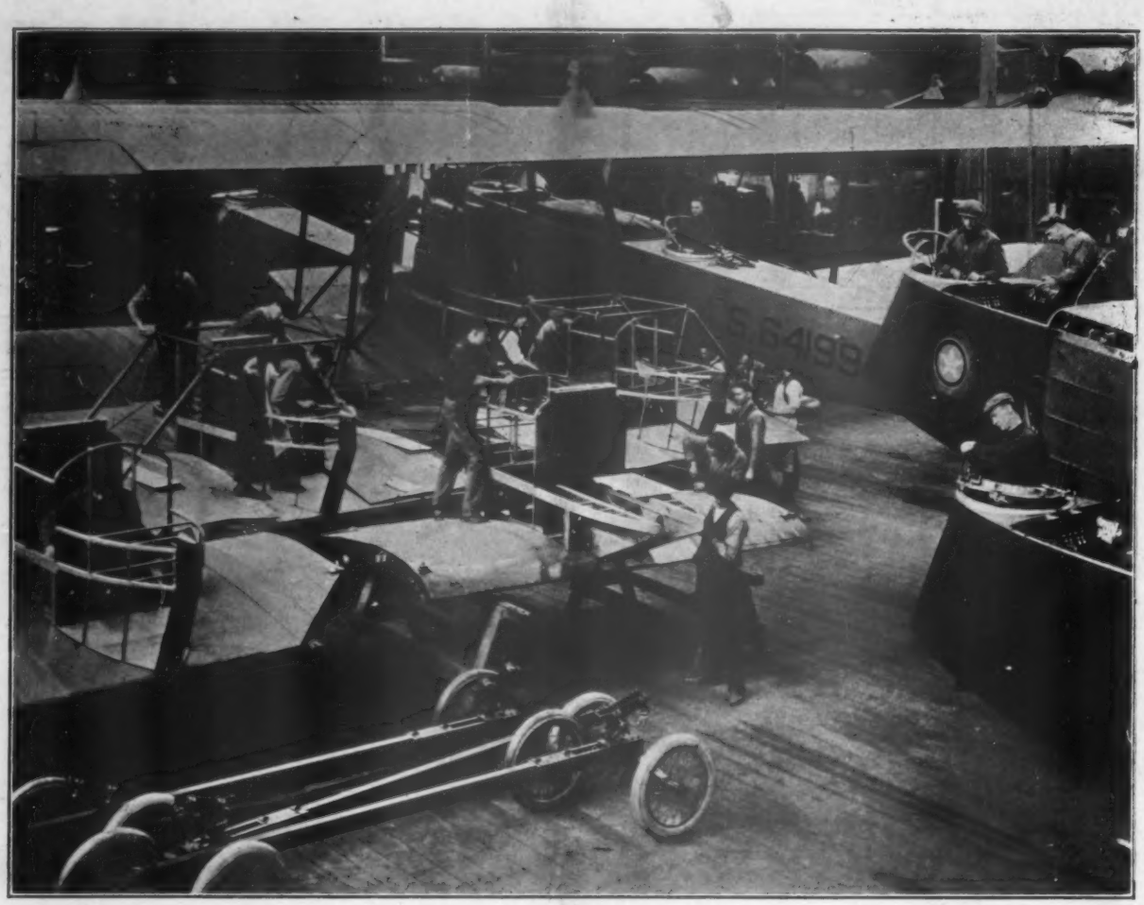

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